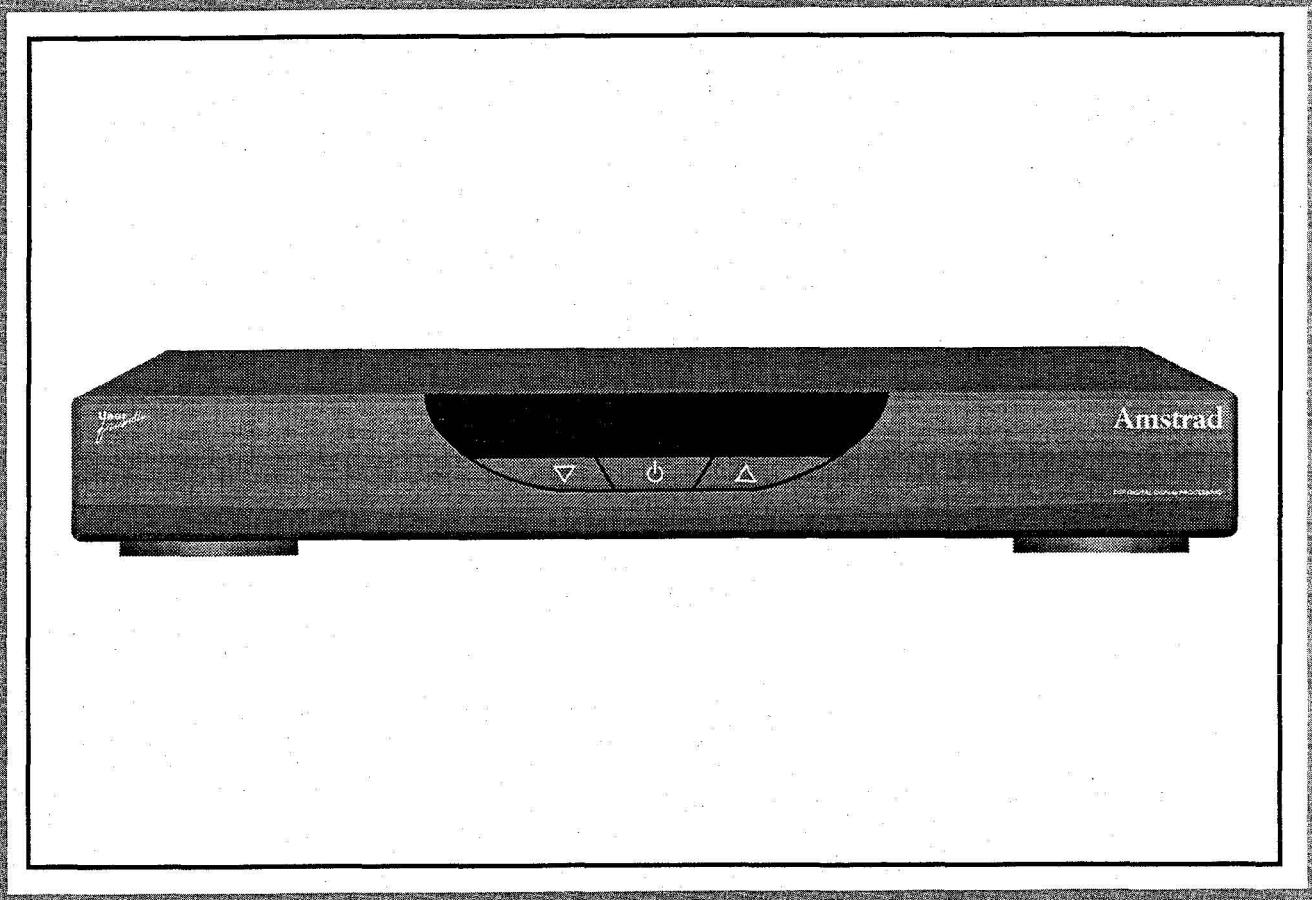
Amstrad



SRX1001/2

SATELLITE RECEIVER

SERVICE MANUAL

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Date of first publication August, 95

Manufacturer reserves the right to supply selective components.
Information published was latest at the time of print.

Technical Specifications

Tuner	
No. of Channels	300
Tuning Range	700-2050MHz
LNB High Band Switching	22kHz Tone (600mV pk-pk)
LNB Supply Output	13-17VDC 450mV
Local Osc Range:	4.9-5.4GHz C Band 9.3-12GHz Ku Band
Local Osc Fine Tuning	±10MHz
Channel Bandwidth:	27/36MHz
Threshold:	6dB Typical (Static)
AM Co Channel Interference Threshold:	-15dB Typical
IF Output:	480MHz (36MHz Bandwidth)
IF Output Level:	-35dB Typical
Modulator	
UHF Modulator Output:	Channel 38 (Adjustable 21-69)
TV System:	PAL BG (Adjustable I-BG)
Video	
External Decoder Input / Output Signal:	MAC/Clamped/Unfiltered
Input Level (TV/VCR/Ext./Decoder)	1V pk-pk, 75 Ω
O'put Level (TV/VCR/Audio Out/Decoder)	1V pk-pk, 75 Ω
On Screen Display:	10 Rows x 24 Columns (8 Colours)
On Screen Languages:	Eng., Ger., Fr., Sp., Dutch,Pol.,It.,Cz.
Programme Timer:	8 Event / 1 Year (Once/Dly/Wkly)
Satellite Audio	
Audio System:	Wegner Panda 1 Stereo
Audio Modes:	30
Audio Subcarrier Range:	5.0-9.0MHz (Stereo l/r Subcarrier Independently Tuneable)
Audio Bandwidth:	130,180,200,280,380kHz, 500kHz (Mono Only)
Audio De-emphasis:	50uS, 75uS, J17 (Fr Telecom)
Audio Signal Routing:	Internal / External (Via Decoder)
Tone Control:	±12 dB at 100Hz Bass ±12dB at 10kHz Treble +6dB/100Hz, +6dB/10kHz
Loudness	
Input Level (TV/VCR/Ext./Decoder):	0.5V RMS Nominal at 10k Ω Min. Input Impedance (2V Max.)
Output Level (VCR/Decoder):	0.5V RMS Nominal at 50 kHz Input Deviation (2V Max.)
Output Level (TV/Audio Out):	0.5V RMS Nom. (Vol. cont 0-2.5V)
General	
Input Output Connectors:	LNB 75 Ω F Type x2 UHF 75 Ω Coaxial x2 21 Pin Scart TV/VCR/Ext. Decoder/Canal+ Audio Out (L/R) RCA Phono x2 IF Out 75 Ω F Type
Mains Supply:	220-230VAC 50Hz
Dimensions:	360x320x55mm

SAFETY TESTS

Please Note: When any work is carried out on this product, the following safety tests must be carried out to ensure continued safety.

1) Flash test from the mains lead with live and neutral together to all accessible metal points at 3kV.

2) Megger test at 500V dc from the mains lead with live and neutral joined together to all accessible external metal points, reading must not fall below 4M Ω.

In keeping with our policy of continually improving our Service and Technical quality of our products, we reserve the right to change type manufacturer, source of supply or technical specifications at any time.

Amstrad plc
Brentwood House, 169 Kings Road, Essex CM14 4EF

SRX1001/2

Circuit Description

To aid the description of the various complex circuits, the receiver has been split into 4 main functional blocks which are listed below:

1. Control Block
2. Video Block
3. Audio Block
4. Power Supply

All components and connections of the receiver will be described in one of these main blocks.

Control Block

There are 3 control Block Diagrams which describe this block. The main component is the uProcessor IC302 in the PiggyBack PCB which is an NEC 8 bit uProcessor utilising 64K external ROM.

Control Block Diagram 1 details the control ports and their connection to the various PCBs. Diagram 2 names each control port of the control uProcessor and describes the connection to the Main PCB.

The control ports can be further split up into the following categories:

1. uProcessor Control Buses
2. uProcessor Video Control Ports
3. uProcessor PSU and Misc. Control Ports
4. uProcessor front panel data link
5. Miscellaneous Control Ports

uProcessor Control Buses

I²C-1
This Control Bus drives IC1, the E²PROM which stores half of the programme information and the OSD stored options, the tuner, which selects the satellite channel, IC3, the audio signal processor, which demodulates and switches the audio and IC802, the L and R audio volume control.
Connections
Data Port 60 IC302 pin 27 → PLB2 pin 13 → (IC13 pin 35) → IC3 pin10 →
SDA COMMON Tuner1 pin4 → IC1 pin 5
Clock Port 61 IC302 pin 28 → PLB2 pin 11 → (IC13 pin 36) → IC3 pin9 →
SCL1 Tuner1 pin5 → IC1 pin 6

I²C-2
This Control Bus drives IC2, the E²PROM which stores the 2nd half of the programme information.
Connections
Data Port 60 IC302 pin 27 → PLB2 pin 13 → (IC13 pin 35) → IC2 pin5
SDA COMMON
Clock Port 62 IC302 pin 29 → PLB2 pin 9 → (IC13 pin 37) → IC2 pin6
SCL2

DATA BUS
This uProcessor output bus controls IC8, the On Screen Display IC. In conjunction with this bus lines the IC will also require it's own enable line from the control uProcessor IC302.
Connections
Data Port 21 IC302 pin 58 → PLB1 pin 4 → (IC13 pin 2) → IC8 pin 7
SER-BUS-DATA
Clock Port 22 IC302 pin 59 → PLB1 pin 6 → (IC13 pin 3) → IC8 pin 2 →
SER-BUS-CLK

DOWNLOAD BUS (Digital Ready)
To download the contents of one receivers E²PROM to another receivers, the receivers must be linked via this bus. This bi-directional bus is also used when an external digital decoder takes control of the receiver.
Connections
Data Port 26 IC302 pin 63 → PLB1 pin 14 → (IC13 pin 7) → R47 → SK3 pin 10
DOWNLOAD DATA (Decoder Scart)
Clock Port 27 IC302 pin 64 → PLB1 pin 16 → (IC13 pin 8) → R46 → SK3 pin 12
DOWNLOAD CLOCK (Decoder Scart)

uProcessor Video Control Ports

OSD ENABLE
As well as the Data Bus, IC8, the On Screen Display IC, also requires it's own enable line.
Connections
Port 25 IC302 pin 62 → PLB1 pin 12 → (IC13 pin 6) → IC8 pin 6

C/KU Control
By pressing the INSTALL or the TUNING buttons, the menus for BAND (C or Ku) and VIDEO INVERT (ON or OFF) can be accessed. When either of these menu options are changed this control line will toggle HI for Ku and OFF and LO for C and ON. (see the inverted video switch of the Video Block Diagram)
Connections
Port 34 IC302 pin 5 → PLB2 pin 10 → (IC13 pin 13) → PLD1 pin 2→ TR31 Emitter

BB/DE Control
By pressing the TUNING buttons, the menu for Decoder Output can be set to one of four settings. Two of these settings are MAC and Unfilter. When either of these menu options are changed this control line will toggle HI for MAC, Clamped and OFF and LO for Unfiltered. (see the BB/Demph switch of the Video Block Diagram)
Connections
Port 35 IC302 pin 5 → PLB2 pin 12 → (IC13 pin 14) → PLD1 pin 3→ TR39 Emitter

VCR1 Control
The RECORD SOURCE button of the remote control has 3 options. This control line together with VCR2, from the OSD IC, control the video output to the VCR Scart. For LO, SAT is routed and HI, VCR is routed.
(see the VCR video source select switch of the Video Block Diagram)
Connections
Port 36 IC302 pin 7 → PLB2 pin 14 → (IC13 pin 15) →IC5 pin 2

VIDEO BLANK Control
When there is no video signal coming from the tuner, in order to get the OSD to appear without the picture distorting due to video noise, the video input to the OSD IC has to be blocked. This control lines only performs this function when the sync good detector has detected bad video and the uProcessor makes the decision to put this control line LO in order to block the video. To stop spurious tuner outputs upsetting an otherwise clean picture, the uProcessor software has a software filter to only blank the video when necessary. With good video signals this line will be HI Z.

(see the OSD Block of the Videocrypt Block Diagram)
Connections
Port 11 IC302 pin 48 → PLB1 pin 15 → (IC13 pin 56) →LK12 →D18

SYNC-GOOD Control
This control line is an input to the main uProcessor which detects wither the incoming video has good syncs or not and allows the uProcessor to make the decision on whether to blank the video or not. If the synchronisation of the video is good this control line will be HI Z otherwise it will be pulled LO.
(see the OSD Block of the Videocrypt Block Diagram)
Connections
Port 12 IC302 pin 49 → PLB1 pin 13 → (IC13 pin 57) →R134

uProcessor PSU and Miscellaneous Control Ports

LNB ON/OFF
When the receiver is put into stand-by or if a short circuit of the LNB power supply has been detected, this control line will go HI and the power to the LNB will turn OFF.
Connections
Port 30 IC302 pin 1 → PLB2 pin 2 → (IC13 pin 9) → PLA1 pin 10 → PL603 pin 10 →IC602 pin 3

POLARITY H/V
In the Tuning menu the Polarity option can be set to Vertical or Horizontal. This control line will go LO for Horizontal and go HI Z for Vertical.
Connections
Port 37 IC302 pin 8 → PLB2 pin 16 → (IC13 pin 16)→ PLA1 pin 9 → PL603 pin 9 →IC602 pin 1

S/C DETECT
This line is an input to the uProcessor to detect if the LNB power supply has been externally shorted. In normal operation this line will be HI and LO if there is a short circuit.
Connections
Port 02 IC302 pin 38 → PLB2 pin 5 → (IC13 pin 46) → TR12 collector

POWER GOOD
This line is an input for fast detection of a mains power failure which enables the uProcessor to perform certain functions before the +5 volt supply is lost and the uProcessor stops functioning. The line is HI in normal operation and LO on power failure. The uProcessor has some software filtering to prevent glitches in the power supply manifesting incorrectly as a power failure.
Connections
Port 01 IC302 pin 37 → PLB2 pin 7 → (IC13 pin 45) → TR25 emitter

FUNCTION
In the tuning menu the External Switch option can be toggled OFF or ON. For OFF this control line is LO and for ON it is HI.
Connections
Port 33 IC302 pin 4 → PLB2 pin 8 → (IC13 pin 12) →PLJ1 pin 8→ PL700 pin 8→ R704

VCR-8
This is an input to the uProcessor which enables a piece of A/V equipment to signal to the uProcessor that it is connected or is de-scrambling via the +12 Volt signal on the Scart pin 8. If this signal is present this input will be HI.

Connections

Port 16 IC302 pin 53 → PLB1 pin 5 → (IC13 pin 61) → D9

TV-8
This is an output for the uProcessor to signal to the Scart connected TV that the receiver is powered out of standby. In some TVs the presence of +12 Volt on pin 8 of the Scart will put the TV automatically into A/V input mode and thus the satellite video picture will be viewed on the TV. For the receiver in standby this control line will be HI and LO out of stand-by.
Connections

Port 15 IC302 pin 52 → PLB1 pin 7 → (IC13 pin 60) →R88

uProcessor Front Panel Data Link

IR-DATA
The Infra-red data stream from the IR sensor is routed directly to the main uProcessor.
Connections

Port 00 IC302 pin 36 → PLB2 pin 15 → (IC13 pin 44) → PLK pin 2 →

DATA BUS
This uProcessor output bus, which has previously been described, is also used in the communication link between the two uProcessors.
Connections
SER-BUS-DATA
Port 21 IC302 pin 58→PLB1 pin 4→(IC13 pin 2)→LK3C→LK3B→PLK pin 3 →
SER-BUS-CLK
Port 22 IC302 pin 59→PLB1 pin 6→(IC13 pin 3)→LK4C→LK4B→ PLK pin 8→ FIP Front Panel PCB *PL302 pin 6 → IC301 pin 14*

Miscellaneous Control Ports

VCR / OTHER
(see the DECODER audio source select switch of the Audio Block Diagram)
Connections

Port 0 IC3 pin 5 →IC6 pins 9 & 10

TV-1
The VIEW SOURCE button of the remote control has 3 options. This control line together with TV-2, control the video output to the TV Scart. For LO, either SAT, TV or LINE-IN are routed and for HI, VCR, AUX or EXT are routed.
(see the TV video source select switch of the Video Block Diagram)
Connections

Port 0 IC8 pin 2 → IC9 pin 2

TV-2
The VIEW SOURCE button of the remote control has 6 options. This control line together with TV-1, control the video output to the TV Scart. For LO, either TV, VCR or LINE-IN are routed and for HI, SAT, AUX or EXT are routed.
(see the TV video source select switch of the Video Block Diagram)

Connections

Port 1 IC8 pin 22 → LK9 → IC9 pin 3

View Source	*TV1*	*TV2*
TV LINE-IN	*0*	*0*
SAT	0	1
VCR	1	0
AUX/EXT	1	1

VCR-2
The RECORD SOURCE button of the remote control has 4 options. This control line together with VCR-1, from the main uProcessor , control the video output to the VCR Scart. For LO, SAT AND VCR are routed and HI, AUX and EXT are routed.
(see the VCR video source select switch of the Video Block Diagram)

Connections

Port 2 IC8 pin 23 → IC5 pin 3

View Source	*VCR1*	*VCR2*
SAT	*0*	*0*
AUX/EXT	0	1
VCR	1	0
AUX/EXT	1	1

Video Block

The video Block Diagram shows the video chain from Tuner through to the TV Scart and all the other Scart inputs and outputs. The main switching element is the Sanyo LA7952 Video IC which has internal buffer amplifiers. The diagram is split into two main parts with the VideoCrypt PCB performing most of the video processing and the Main PCB handling the majority of the switching. The block diagram can be broken down into the following sections:

1. Tuner
2. Inverter Amplifier
3. De-emphasis and switches
4. Video Band pass filter
5. Energy Dispersal Clamp
6. VideoCrypt Decoder
7. TV Video source select switch
8. DEC Video source select switch
9. VCR Video source select switch
10. On Screen Display

Tuner

The tuner has 7 connections, 3 are power supplies, 2 are I²C, 1 is a 4MHz reference and the other is the baseband output on pin 7 which is fed directly to the Video processing corner of the Main PCB via PLE1 pin 2 and buffered by TR5 to the audio sub-carrier filter.

Inverter Amplifier

The Video level is adjustable by RV2. The baseband signal is then amplified by TR32 which has a gain of 1. Both an inverted output, buffered by TR40, and a non-inverted output are taken from the transistor and fed to the analogue switch, IC12, which is controlled by the C/KU or Video Invert variables on the OSD menus. TR31 is used to convert the +5 Volt logic signal from the uProcessor to a +12 Volt signal to switch IC12.

De-emphasis and switches

The output of IC12 is buffered by TR41 and is also fed to pin 3 of the switch input as the unfiltered signal. After TR41, the signal is de-emphasised by the amplifier comprising TR33 and TR34. Capacitors C148, C150 and resistor R126 set the time constant of the de-emphasis network. The output of this circuit is then fed to pin 5 of the switch as the de-emphasised signal.

Video Low pass filter

Inductors L15, L14 and capacitors C146-147 and C151-152 form a 5th order 5MHz low pass filter. To compensate for the insertion losses and phase shift of the filter the signal is amplified by TR36 and TR35 and is phase compensated to reduce the Chrom to Luma delay.

Energy Dispersal Clamp

Transistors TR36 and TR35 form an amplifier to give correct amplitude composite video into the decoder.

Components TR30, R123, R125, and C144 form a delay corrector to compensate for group delay errors built up in the sound trap.

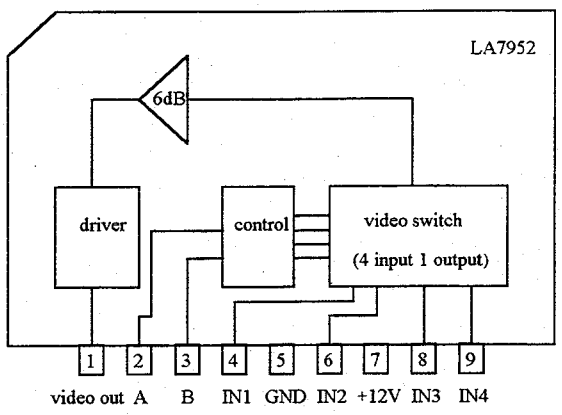
Components C143, R65, R164, TR37, TR28, TR29, TR38 etc. form an energy dispersal clamp. C143 couples the video waveform to the DC bias potential formed by R65 and R164. This voltage is slightly lower than the wanted clamp voltage, so that C143 is generally discharging. Transistors TR29 and TR28 form a comparitor such that
TR37 turns on when the clamped video voltage at the emitter of TR28 falls below the voltage on the the divider formed by R93+R165. Because C143 is discharging, this only happens at the lowest point of the video waveform which is the sync tip.

When TR28 turns on, so does TR37, which immediately charges C143 until the sync tip is clamped to the voltage on R93/R165 at which point TR28 is turned of by comparitor action. TR28 will remain turned off until the next sync tip comes along and the clamping action repeats. R167 and C124 filter off the colour burst (and also sparklies under low signal conditions) to prevent false triggering of the clamp.

TV, DEC and VCR Video source select switch

IC 9, 7 and 5 perform these functions

SANYO Video Switch Block Diagram:



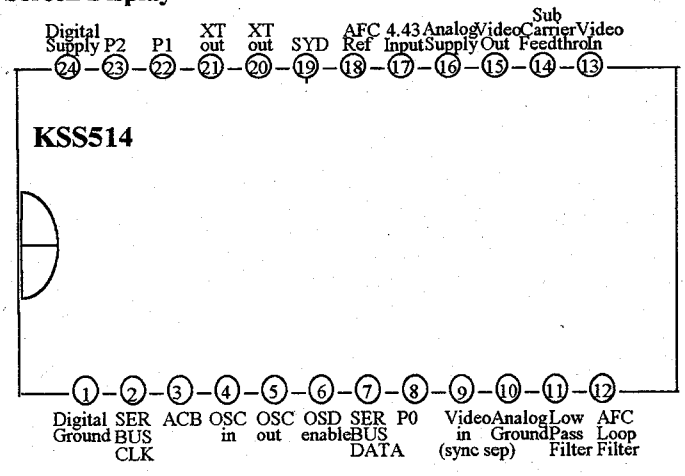
The diagram above shows the internals of the video switch which is used to route the video signals to the TV, DEC and VCR Scarts. The remote control buttons VIEW, DECODER and RECORD SOURCE are used to control the routing via the uProcessor, either directly through it's own ports or indirectly via ports from the OSD IC or the port expander ICs. The logic inputs are +5V TTL with VH 3.0V and VL 1.5V. The video input bias is app. +3V and the video output is biased at app. +6V.

(For the logic truth tables see the Control section.)

On Screen Display

IC8 performs the presentation of the On Screen menus.

SAMSUNG On Screen Display



Power Supplies (Pins 1, 10 16 &24)

There are 2 separate supplies to the IC, the analogue and the digital +5 Volt supplies. The analogue supply has a simple low pass filter while the digital supply has a more complex regulator which also drops the digital supply to it's minimum to prevent jitter and interference.

uProcessor Control (Pins 2, 6 & 7)

This IC is controlled via the serial data bus and a dedicated enable line. The IC can only be written to by the main uProcessor which sets the OSD background colour, the OSD text and the output ports for controlling external devices.

Video Inputs (Pins 9, 13 & 14)

The IC has 2 video inputs. One is for the internal clamp circuitry which generates the necessary horizontal and vertical sync. pulses used to insert the OSD text in the correct positions. The other input goes to the video mixer where the OSD text is mixed with the incoming live video. Before the live video reaches this input, the video goes through a switch, TR15, which is opened whenever there is a lack of a good video signal which has clean sync pulses. By opening the switch there is no disturbance caused by the bad video, and the OSD can be displayed on a blue background. To prevent smearing on SECAM signals some of the croma sub-carrier from the live video is fed into pin 14 which ensures the OSD text also has some chroma component when overlaid on live video(SRX1001 only).

Oscillator Circuits (Pins 4, 5, 20 & 21)

In this application of the IC, an external crystal at 4 times the chroma sub-carrier is used to generate the colour OSD background. The frequency of this oscillator is set by the 17.73445 crystal and can be fine tuned by the variable capacitor C106. The factory setting of this oscillator is 17.7340MHz ± 100Hz which takes into account the loading of a X10 oscilloscope probe on pin 21. The oscillator on pins 4 and 5 is the character pixel clock which sets the time duration of a pixel and hence the width of the characters.

Control Ports (Pins 8, 22 & 23)

This IC is used to control the TV view source selection switch by controlling Ports 0 and 1. The main uProcessors instructs this IC to set the ports HI or LO via the serial data bus. The 3rd control port, P2, is used to control the VCR record source selection switch in conjunction with a port from the main uProcessor.

Video output (Pin 15)

The video output is buffered by TR18, filtered by L9 and is then buffered again by TR16 to provide a 75Ω source impedance driver to the TV Scart.

SYNC Detect (pin 19)

This output line is fed to the main uProcessor to signal wither the incoming live video has good or bad syncs. If the syncs are bad the line will go LO and the uProcessor will then activate the Video Blanking control, thus removing the video input at pin 13, and display the colour OSD background for readable OSD.

External capacitors (Pins 3, 11, 12 & 18)

All of the above pins have high value external capacitors, which cannot be integrated on a silicon wafer, and are required for various filter circuits used in the AFC loop filter, the SYNC separator low pass filter and the AFC reference filter.

Audio Block

The Multi Standard Sound Processor MSP3400 C forms the centre core of the audio circuitry in the receiver. It demodulates the incoming satellite FM signals and performs all the input and output Scart switching as well as providing output ports for controlling other external switches.

1. Audio sub-carrier BaseBand Filter and Amplifier
2. MSP3400 C sound processor

Audio sub-carrier BaseBand Filter and Amplifier

Before being fed to the sound processor the incoming FM sub carriers require to be filtered and amplified to improve the S/N of the demodulated audio.TR5 acts as a buffer between the tuner and the filter. XL7 is a 4.43 MHz trap which removes any chroma signals that may come from the video and L6 and the associated capacitors form one half of a Band Pass Filter between the frequencies of 5 to 9MHz. The other half of the BPF is made from the tuned circuit of TR2 with L7 and C19 setting the tuned frequency at appx 9.6 MHz to give the overall BPF.

MSP3400 C sound processor

This IC, using Digital Signal Processing, converts the incoming sound subcarrier (Mono or stereo) to audio. The IC control each of the following functions: frequency of subcarrier, Mono/Stereo, IF bandwidth, deemphesis Wegner Expender (On/Off), balance, volume, bass and treble control and audio routing between each of the sockets. Ref. to the audio block diagram for more details.

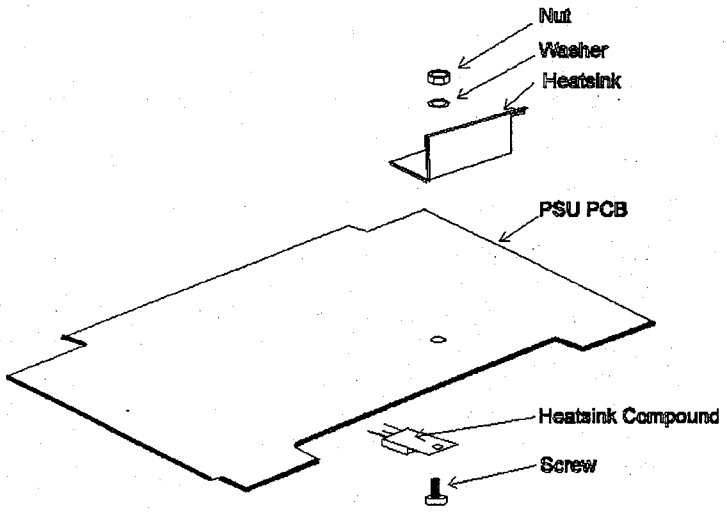
PSU Switching IC Functional Description

IC604 implements with three pins, all functions necessary for the off line switch mode power supply. IC604 integrates a high voltage (700 Volts) power MOSFET and CMOS control circuitry. The control circuitry switches the integrated power MOSFET at a fixed frequency of 100kHz ±10% while the power supply is operating.

The control circuitry adjusts the duty cycle of the power MOSFET to maintain the regulation of the power supply output, it performs this function by monitoring the current feedback into the Control pin 1. The control circuitry also protects the power MOSFET by monitoring its current and temperature.

If you need to change IC 604 follow fitting instructions carefully. The SMT 'D-PAK' device should be replaced with a TO220 version as an upgraded device.

Fitting Instructions For The TOP202YA-TO220
1) With the aid of desoldering braid, desolder the body of the TOP202 from the PCB followed by the pins.
2) Remove excess solder from the finned copper area of the PCB to ensure a smooth and flat surface.
3) Using the nut bolt and locking washer fit the TOP202YA to the PSU and heat sink as shown in the diagram below.
4) Solder the two legs to the PCB, then solder the body of the TOP202YA to the PCB



⚠ **Please note, the heatsink assy will have 300VDC when mains supply is connected**

PSU Fault Finding Instructions

PSU Check: If all DC Voltages are dead.

a) REMOVE the mains power from unit.

b) Inspect the fuse fitted to the PSU PCB. If blown replace with an identically rated fuse. Re-apply power. If the fuse blows, go to the test 3b).

c) IC604 test: Disconnect mains from the unit. Remove the two screws that hold the PSU PCB in place. Locate IC604 soldered flat onto a large silver ground area on the underside of the PSU PCB. Inspect IC604 body; if it looks chipped, cratered or burnt replace (see section1) and repeat the fuse check.

Checks all DC Voltage rails to main PCB.

a) Apply mains power to unit. Led should go red.

b) Connect the -ve lead of a voltmeter to the tuner's metal mounting bracket (0V) or to any of the PCB links silk-screened 0V. (Note: this test relies on a good 0V link between the PSU and main PCBs).

c) Measure the DC voltage on the silk-screen link marked "+5V" (found on PL602).

i. If it is +5V +/- 0.25V Pass to test 1d), else continue.

ii. If the DC voltage on D607's cathode, (D607 is found below D611 on PSU PCB), is +5V +/- 0.5V (+6V off load). Pass to test 1d) else continue.

iii. With power off, check for good continuity between D607 cathode and the +5V link to the main PCB.

d) Measure the DC voltage on the silk-screen link marked "+12V" (found on PL602).

i. If it is +12.5V +/- 0.5V Pass to test 1e), else continue. (up to +16V off load).

ii. If the DC voltage on D611's cathode is +12V +/- 0.5V Pass to test 1e), else continue.

iii. With power off, check for good continuity between the +12V line to main PCB.

e) Measure the DC voltage on the silk-screen link marked "+28V" (found on PL602).

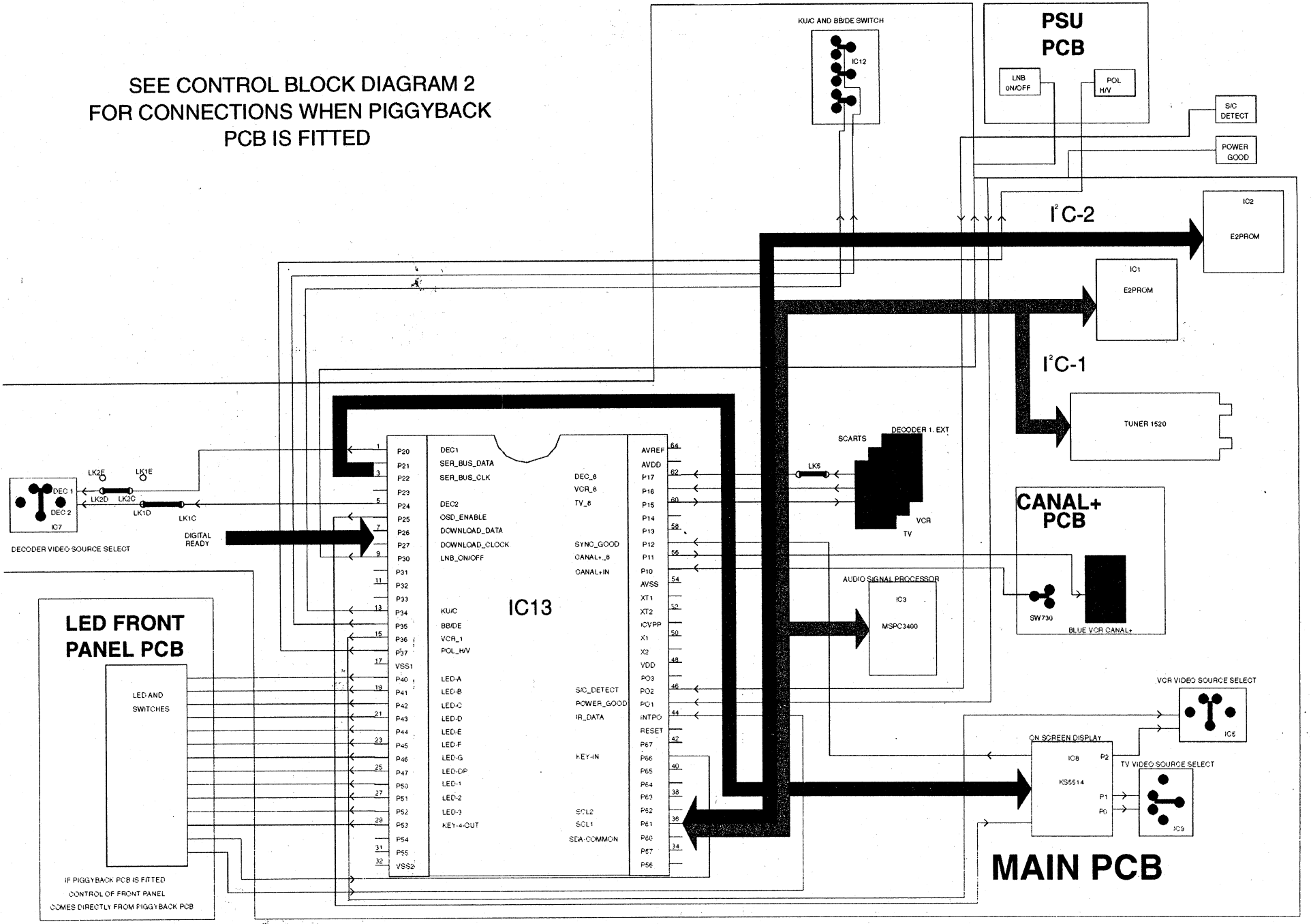
i. If it is +29V +/- 2V Pass to test 1f), if not continue.

ii. If the DC voltage on D609's cathode (PSU) is +30V +/- 3V Pass to test 1f), if not continue (up to +37V off load).

iii. With power off, check for good continuity between D609 cathode and the +28V link

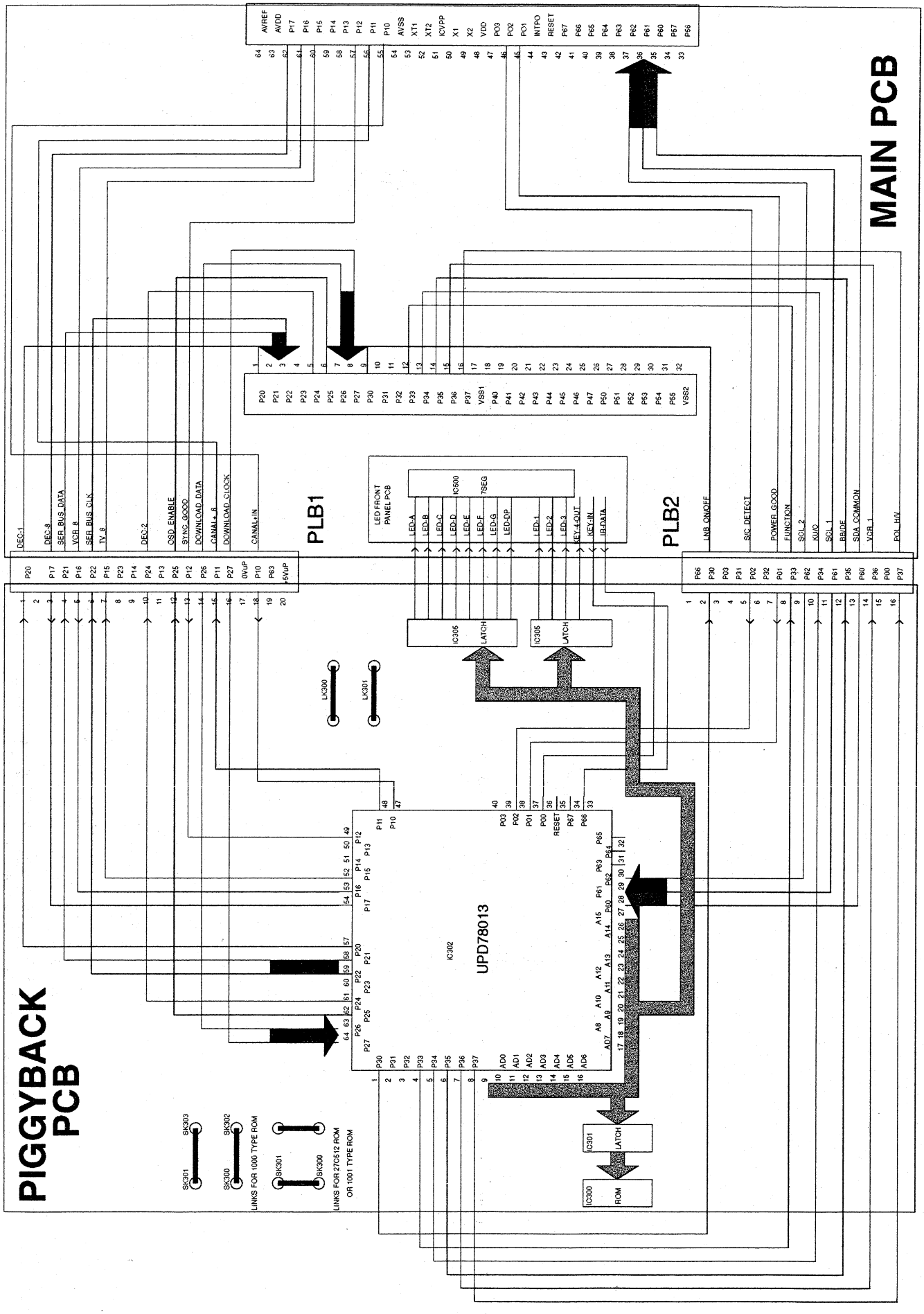
f) Measure the DC voltage at D8 cathode (Main PCB by Tuner)

Should be 27V±5%. If not replace D8.



SRX 1001 CONTROL BLOCK DIAGRAM 1

ISSUE 1.0
24/03/95


SRX 1001 CONTROL BLOCK DIAGRAM 2
MAIN PCB
PIGGYBACK PCB
PLB1
PLB2
UPD78013
IC302
IC305
LATCH
IC300
ROM
IC301
LK300
LK301
SK303
SK302
SK301
SK300
LINKS FOR 1000 TYPE ROM
LINKS FOR 27C512 ROM
OR 1001 TYPE ROM
LED FRONT PANEL PCB
ISSUE 1.0
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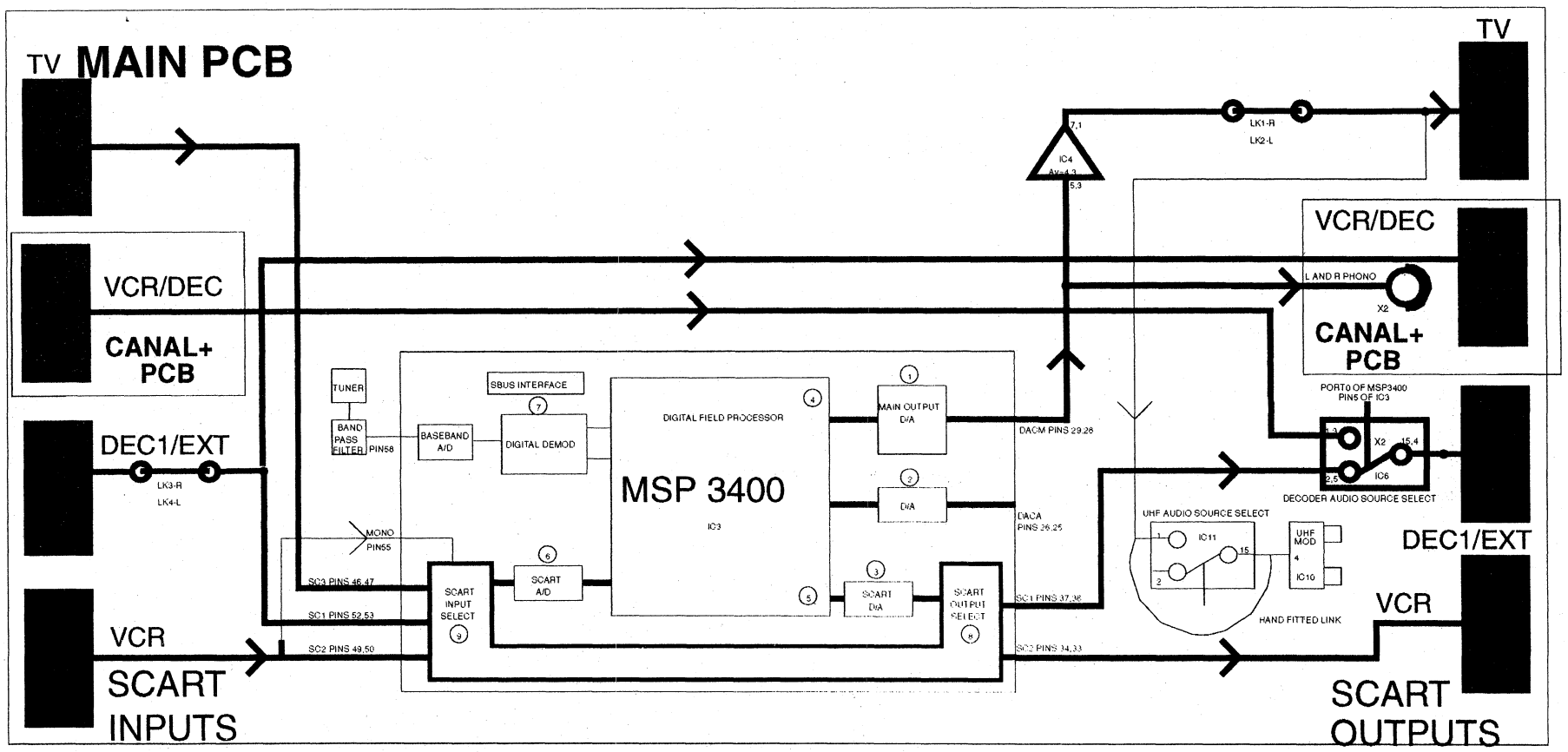


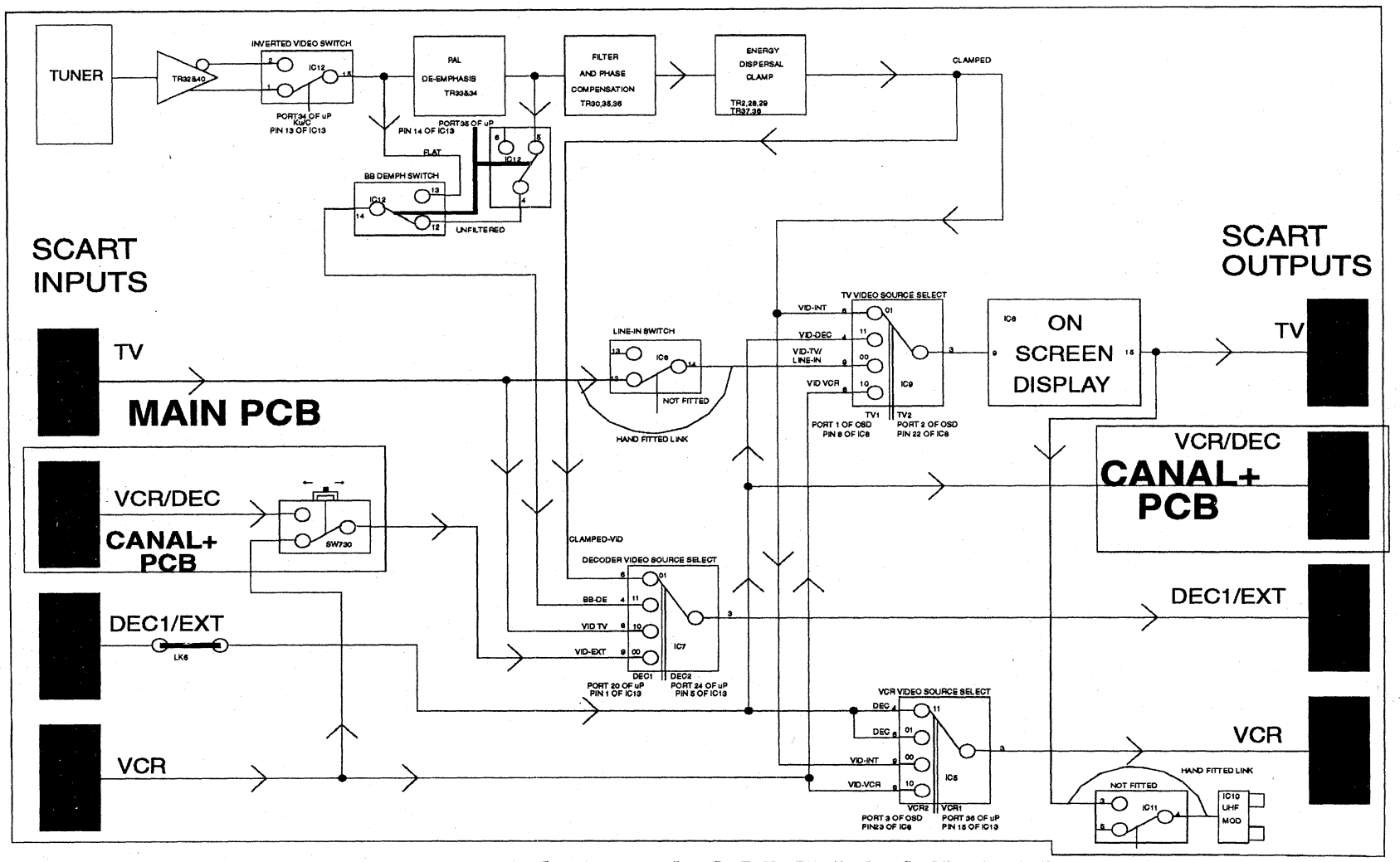
L AND R STEREO

LEFT PIN NUMBER IS ALWAYS FIRST

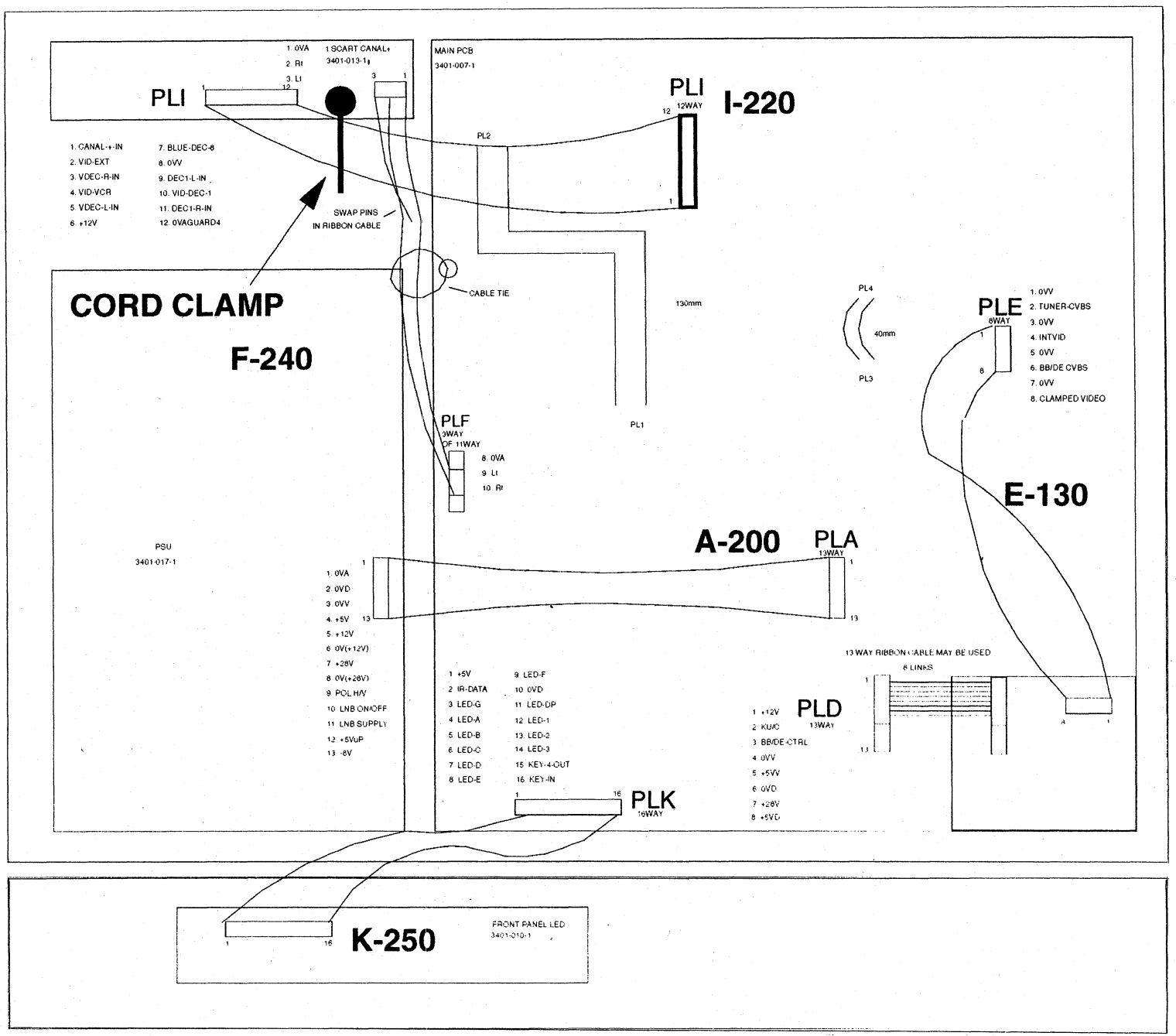
L+R MONO

SRX 1001 AUDIO BLOCK DIAGRAM

ISSUE 1.0
24/03/95

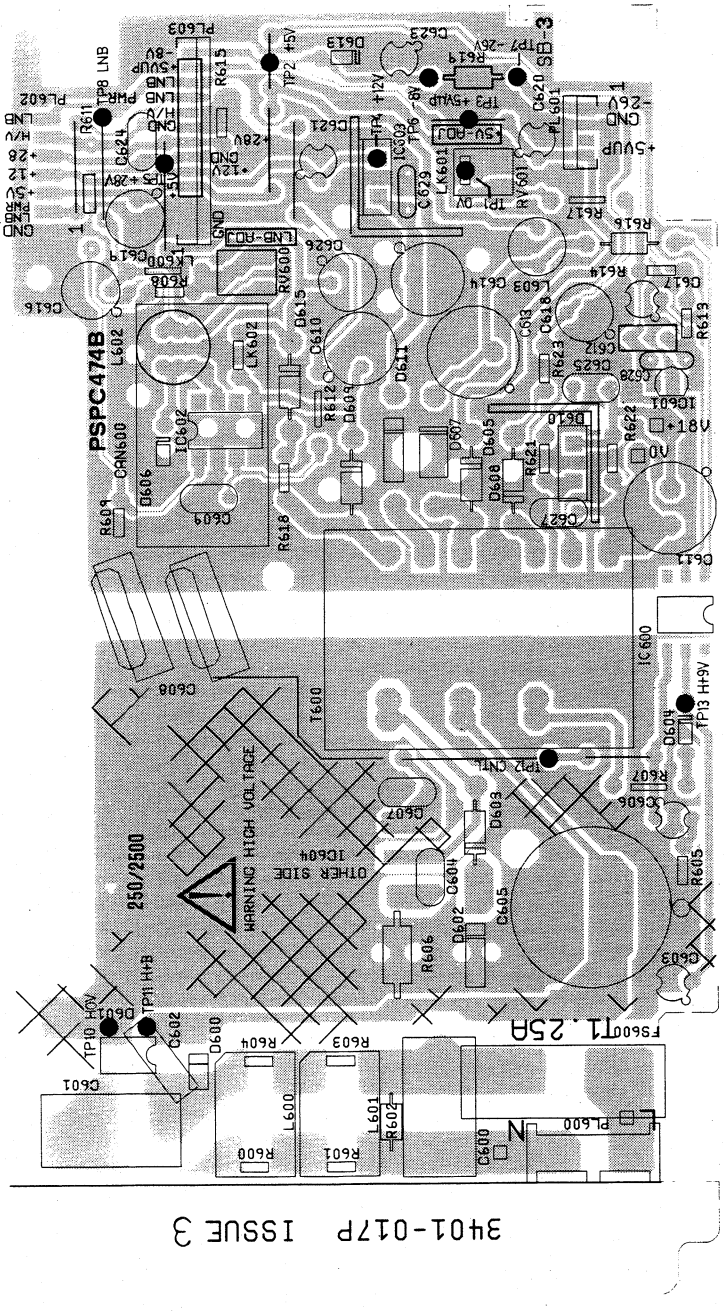


SRX 1001 VIDEO BLOCK DIAGRAM

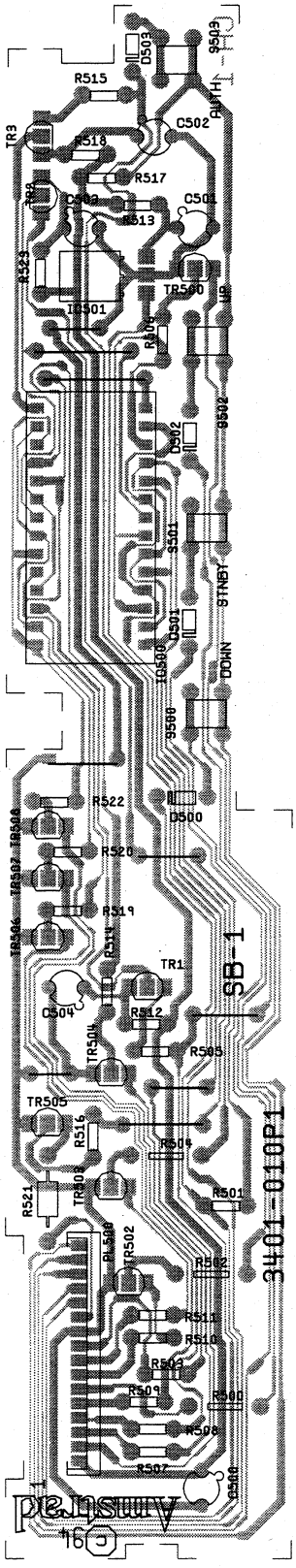


SRX 1001 PCB INTERCONNECTION BLOCK DIAGRAM

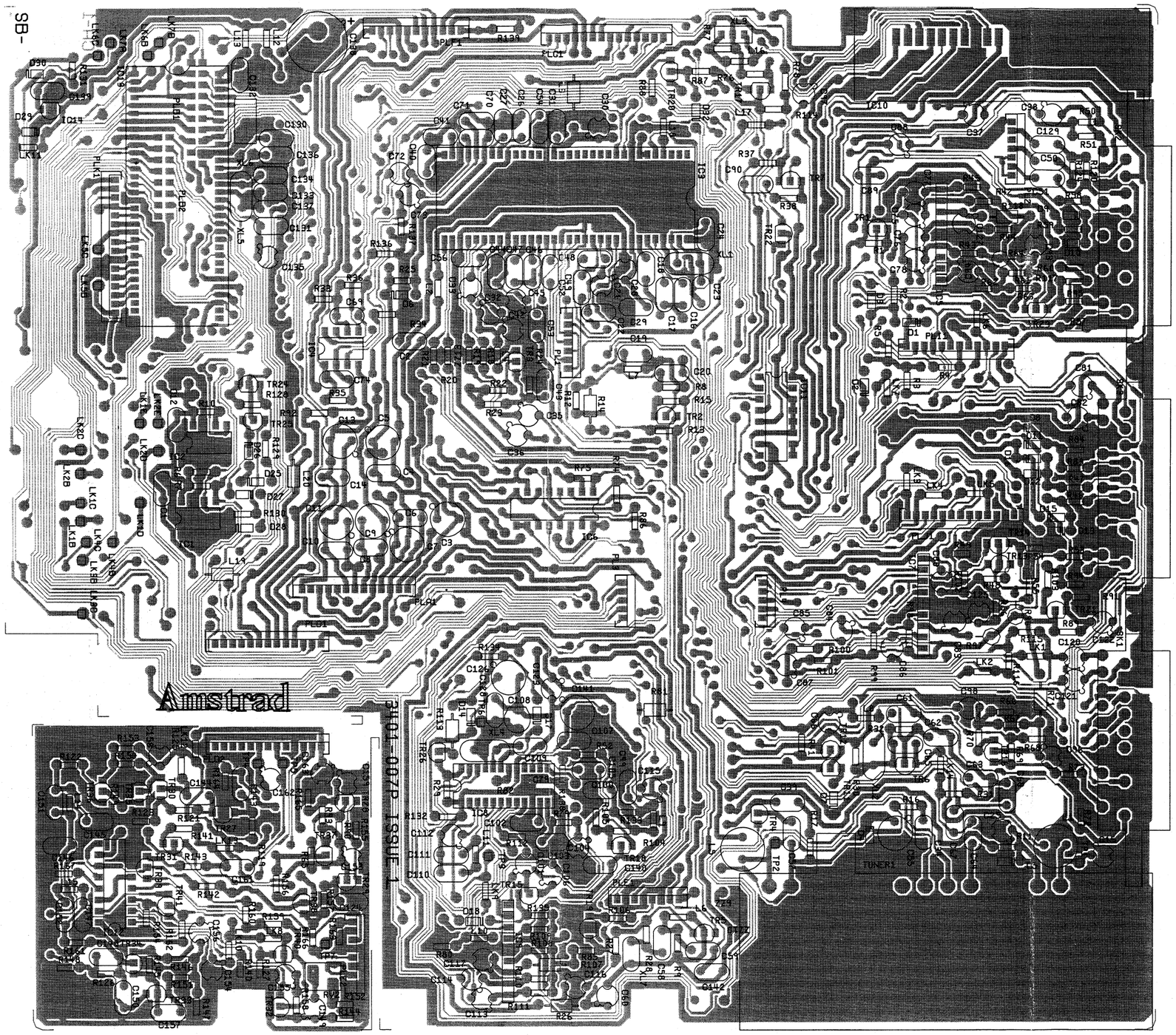
PSU PCB Component Layout



Front Panel PCB Component Layout



Main PCB Component Layout



PSU Schematic Diagram

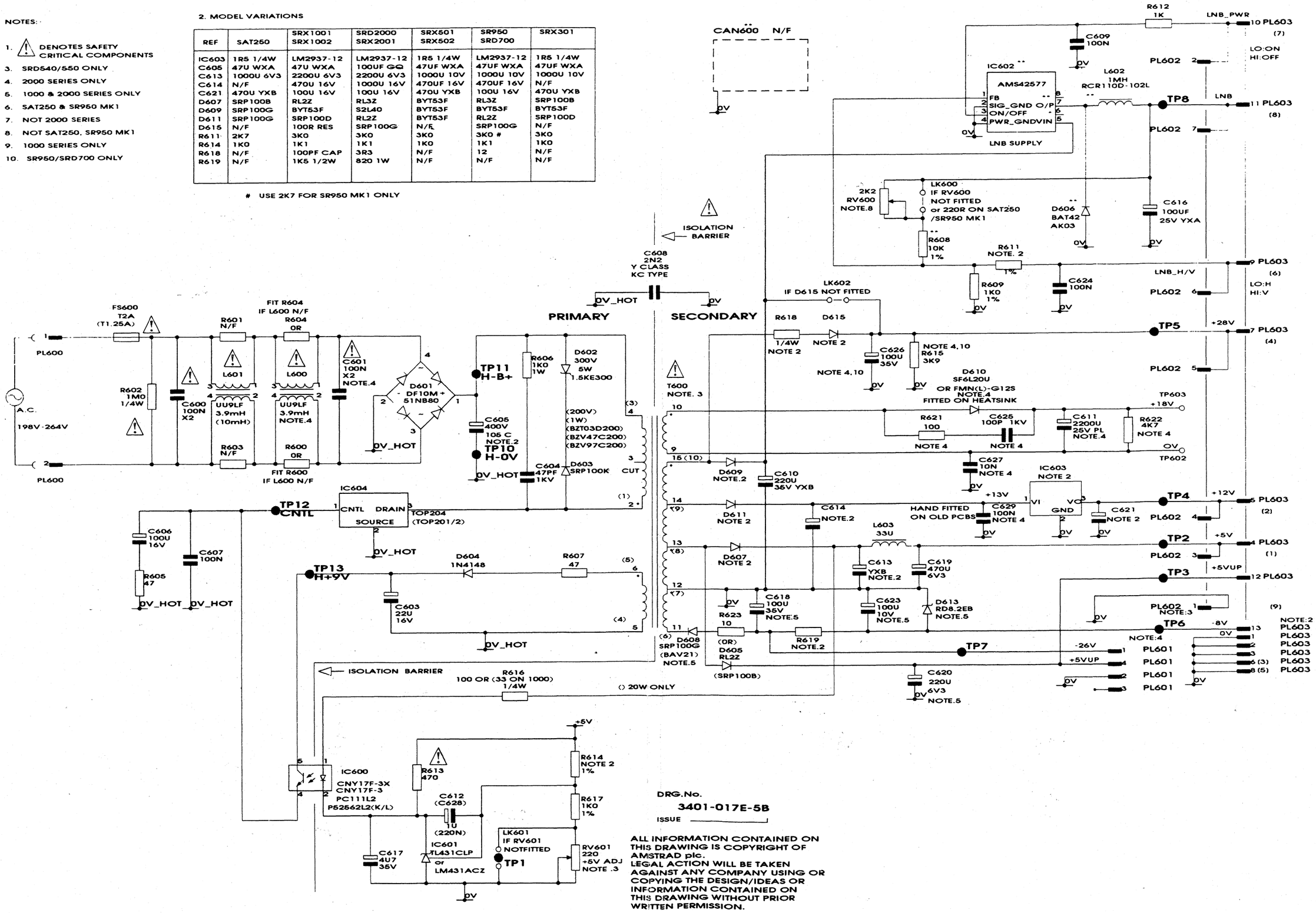
NOTES:

1. ⚠ DENOTES SAFETY CRITICAL COMPONENTS
3. SRD540/550 ONLY
4. 2000 SERIES ONLY
5. 1000 & 2000 SERIES ONLY
6. SAT250 & SR950 MK1
7. NOT 2000 SERIES
8. NOT SAT250, SR950 MK1
9. 1000 SERIES ONLY
10. SR950/SRD700 ONLY

2. MODEL VARIATIONS

REF	SAT250	SRX1001 SRX1002	SRD2000 SRX2001	SRX501 SRX502	SR950 SRD700	SRX301
IC603	1R5 1/4W	LM2937-12	LM2937-12	1R5 1/4W	LM2937-12	1R5 1/4W
C605	47U WXA	47U WXA	100UF GQ	47UF WXA	47UF WXA	47UF WXA
C613	1000U 6V3	2200U 6V3	2200U 6V3	1000U 10V	1000U 10V	1000U 10V
C614	N/F	470U 16V	1000U 16V	470UF 16V	470UF 16V	N/F
C621	470U YXB	100U 16V	100U 16V	470U YXB	100U 16V	470U YXB
D607	SRP100B	RL2Z	RL3Z	BYT53F	RL3Z	SRP100B
D609	SRP100G	BYT53F	S2L40	BYT53F	BYT53F	BYT53F
D611	SRP100G	SRP100D	RL2Z	BYT53F	RL2Z	SRP100D
D615	N/F	100R RES	SRP100G	N/F	SRP100G	N/F
R611	2K7	3K0	3K0	3K0	3K0 #	3K0
R614	1K0	1K1	1K1	1K0	1K1	1K0
R618	N/F	100PF CAP	3R3	N/F	12	N/F
R619	N/F	1K5 1/2W	820 1W	N/F	N/F	N/F

USE 2K7 FOR SR950 MK1 ONLY



DRG.No.
3401-017E-5B
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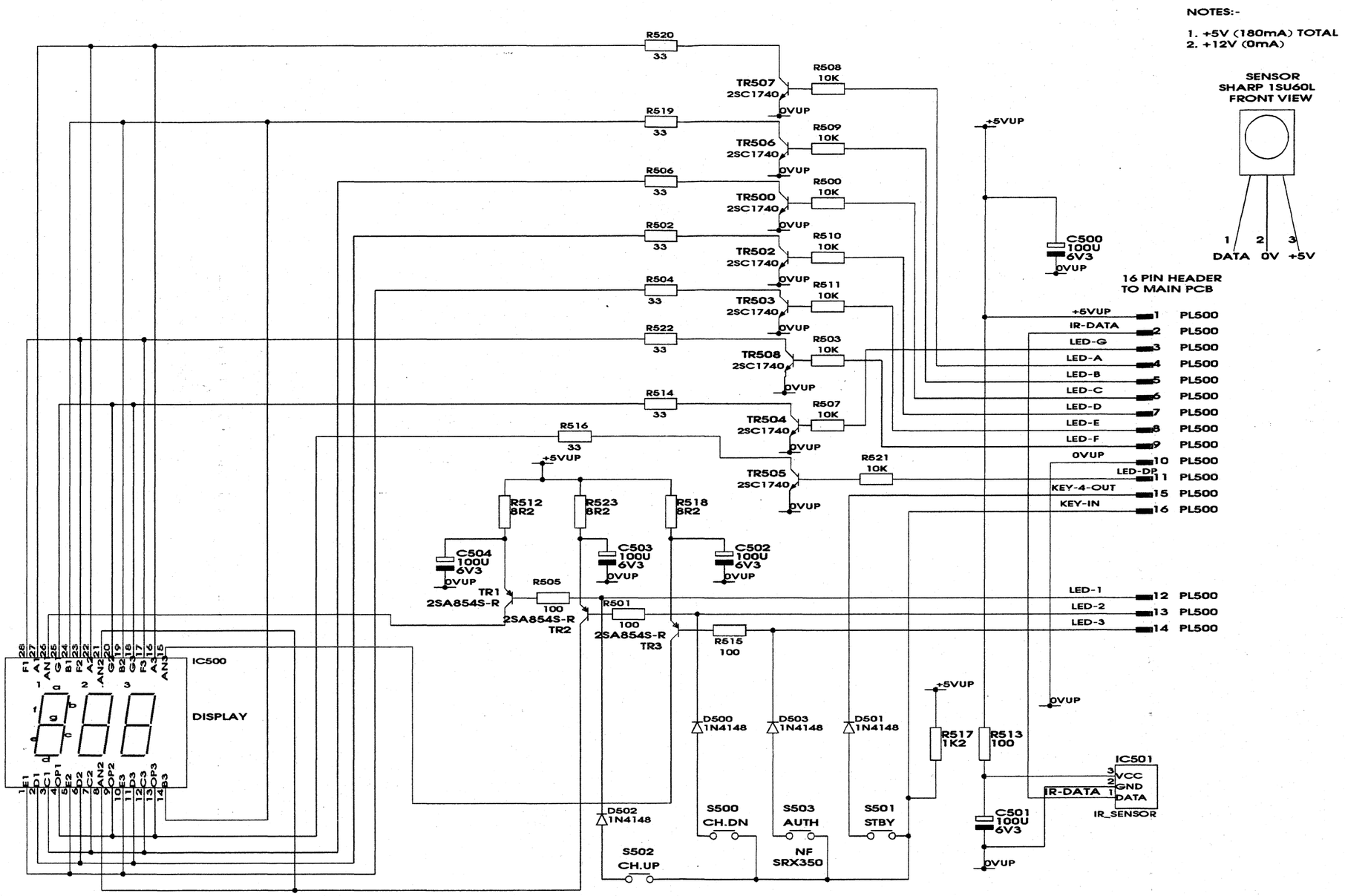
Front Panel Schematic Diagram



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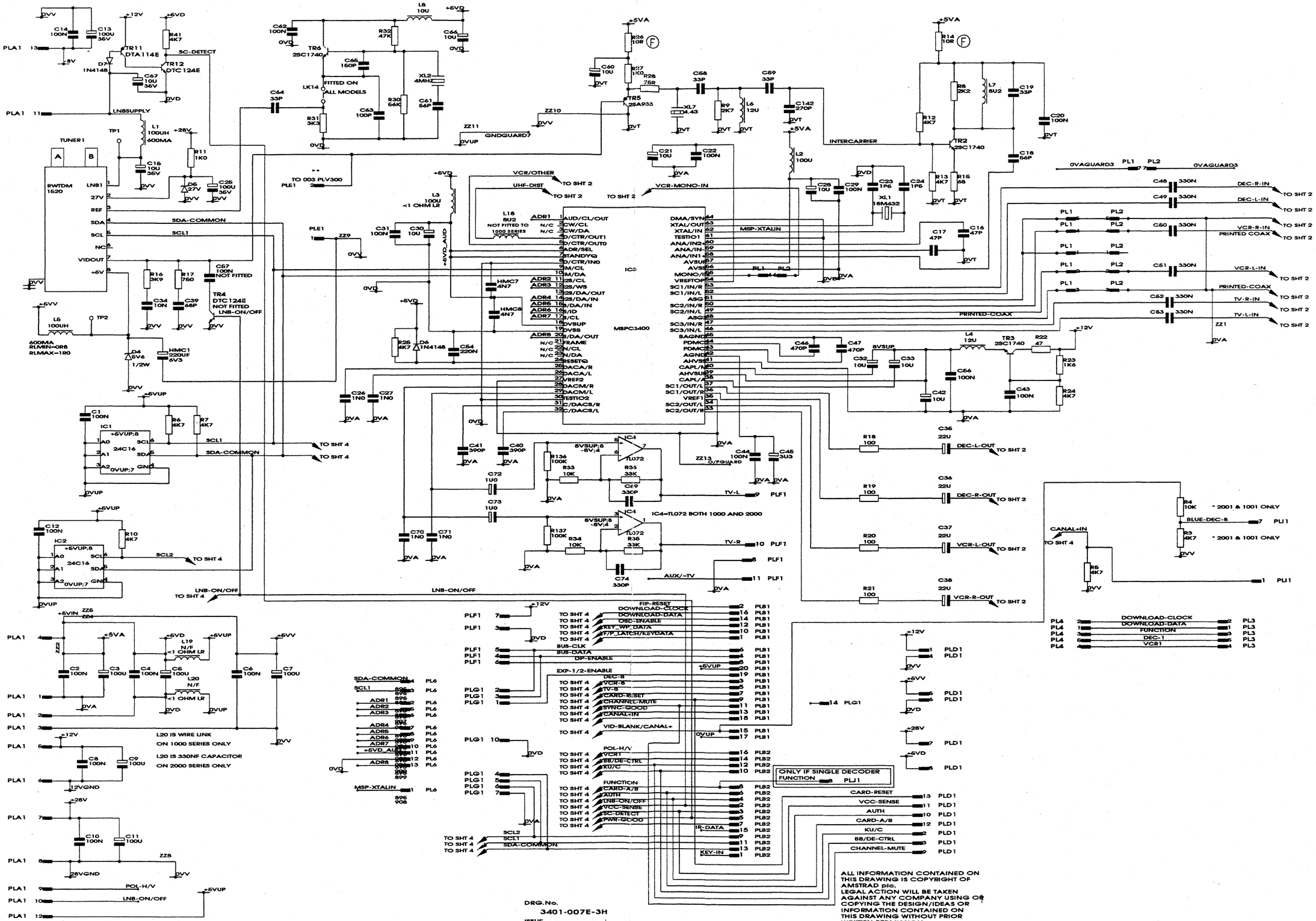
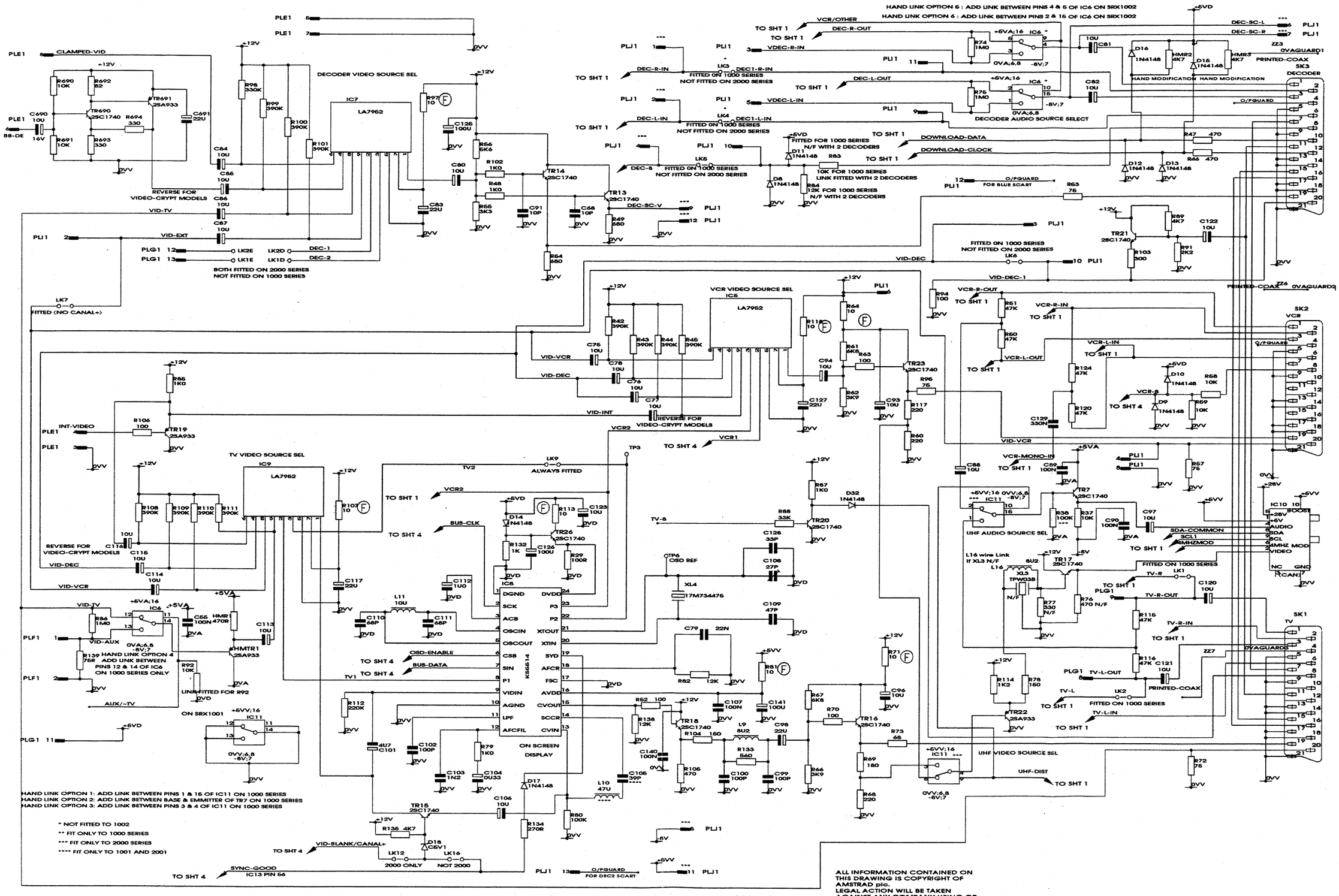
Main PCB Schematic Diagram 1/4



Main PCB Schematic Diagram 2/4


HAND LINK OPTION 5 : ADD LINK BETWEEN PINS 4 & 5 OF IC6 ON SRX1002
HAND LINK OPTION 6 : ADD LINK BETWEEN PINS 2 & 16 OF IC6 ON SRX1002
DECODER VIDEO SOURCE SEL
IC7
LA7962
DECODER AUDIO SOURCE SELECT
VCR VIDEO SOURCE SEL
IC5
LA7952
TV VIDEO SOURCE SEL
IC9
LA7962
UHF AUDIO SOURCE SEL
UHF VIDEO SOURCE SEL
ON SCREEN DISPLAY
KS6614
DOWNLOAD-DATA
DOWNLOAD-CLOCK
REVERSE FOR VIDEO-CRYPT MODELS
BOTH FITTED ON 2000 SERIES NOT FITTED ON 1000 SERIES
FITTED (NO CANAL+)
FITTED ON 1000 SERIES NOT FITTED ON 2000 SERIES
NOT FITTED ON 1000 SERIES
FITTED ON 1000 SERIES
FITTED FOR 1000 SERIES N/F WITH 2 DECODERS
10K FOR 1000 SERIES LINK FITTED WITH 2 DECODERS
12K FOR 1000 SERIES N/F WITH 2 DECODERS
LINK FITTED FOR R92
ON SRX1001
ALWAYS FITTED
HAND LINK OPTION 4 ADD LINK BETWEEN PINS 12 & 14 OF IC6 ON 1000 SERIES ONLY
HAND MODIFICATION
PRINTED-COAX
FOR BLUE SCART
FOR DEC2 SCART
HAND LINK OPTION 1: ADD LINK BETWEEN PINS 1 & 16 OF IC11 ON 1000 SERIES
HAND LINK OPTION 2: ADD LINK BETWEEN BASE & EMMITTER OF TR7 ON 1000 SERIES
HAND LINK OPTION 3: ADD LINK BETWEEN PINS 3 & 4 OF IC11 ON 1000 SERIES
* NOT FITTED TO 1002
** FIT ONLY TO 1000 SERIES
*** FIT ONLY TO 2000 SERIES
**** FIT ONLY TO 1001 AND 2001

DRG.No. 3401-007E-3H

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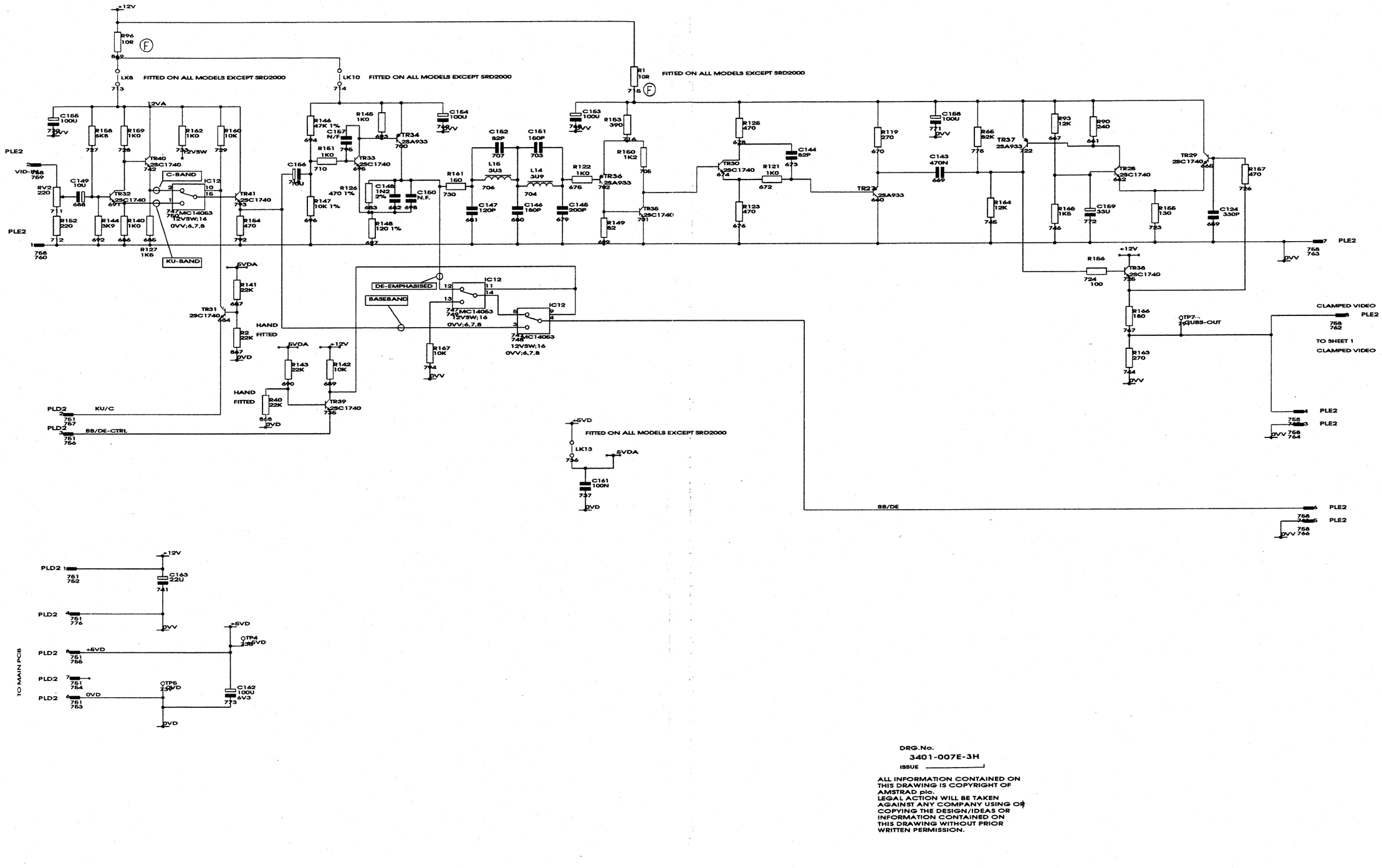
Main PCB Schematic Diagram 3/4



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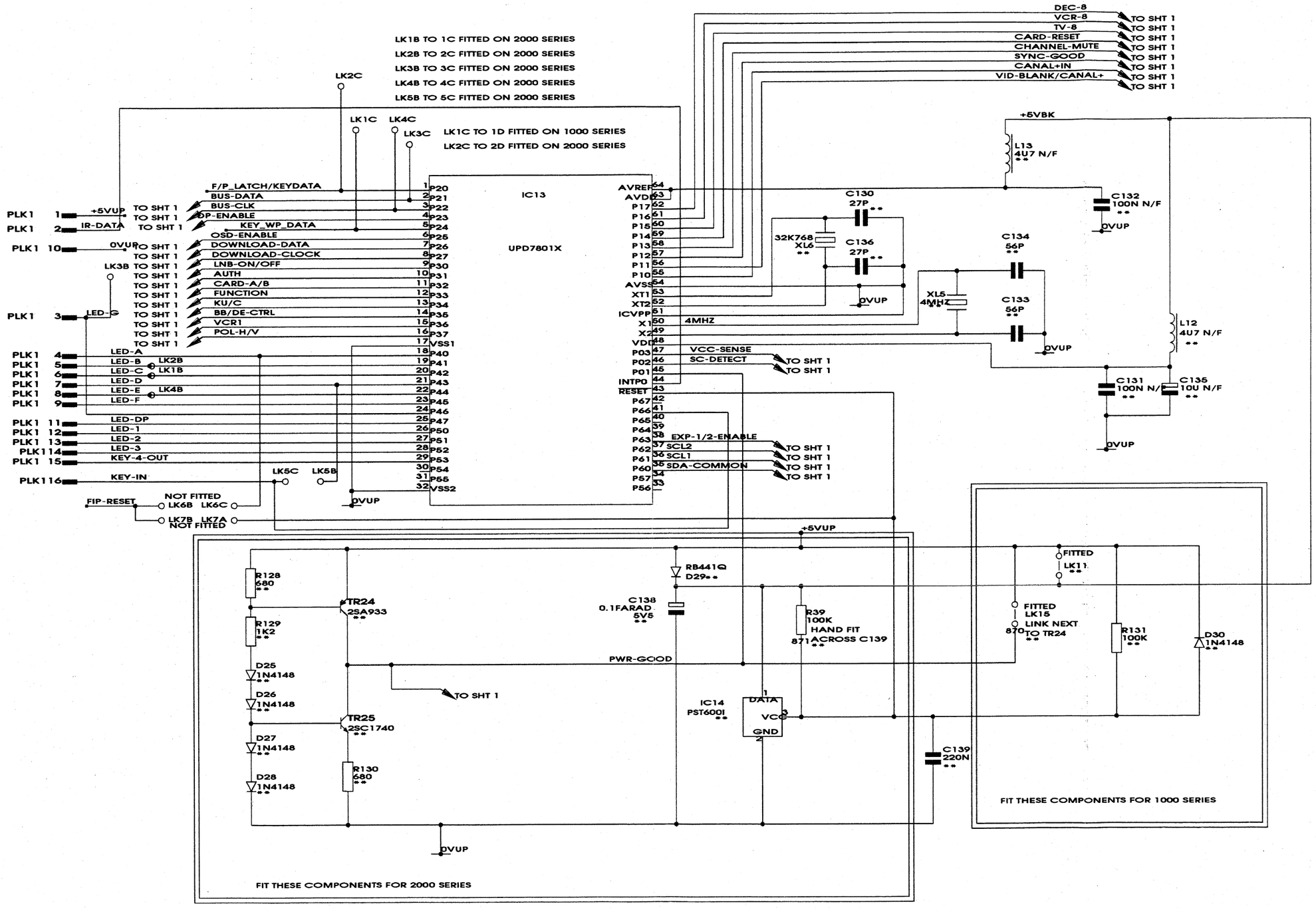
Main PCB Schematic Diagram 4/4



** DO NOT FIT IF PIGGY-BACK PCB FITTED

DRG.No.
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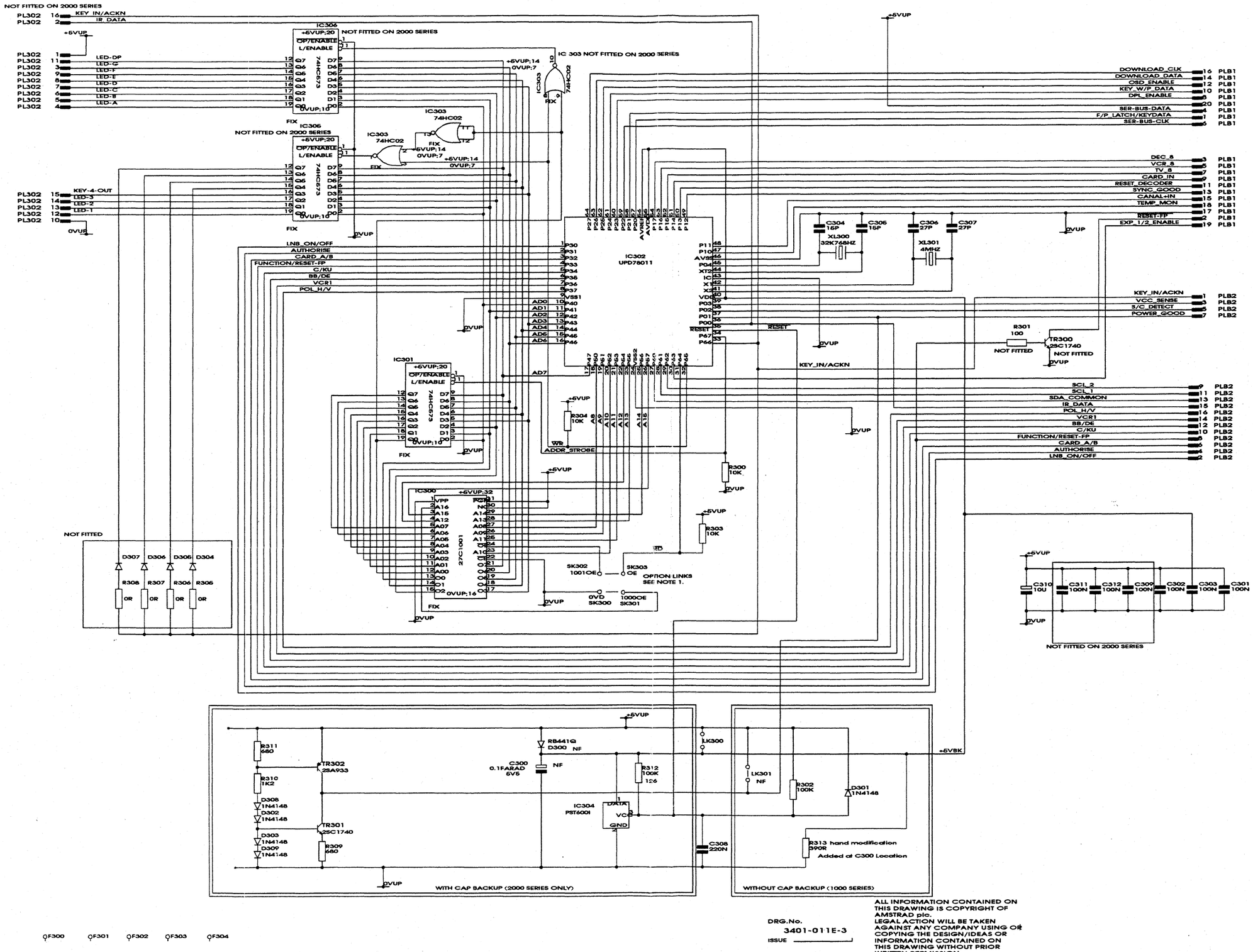
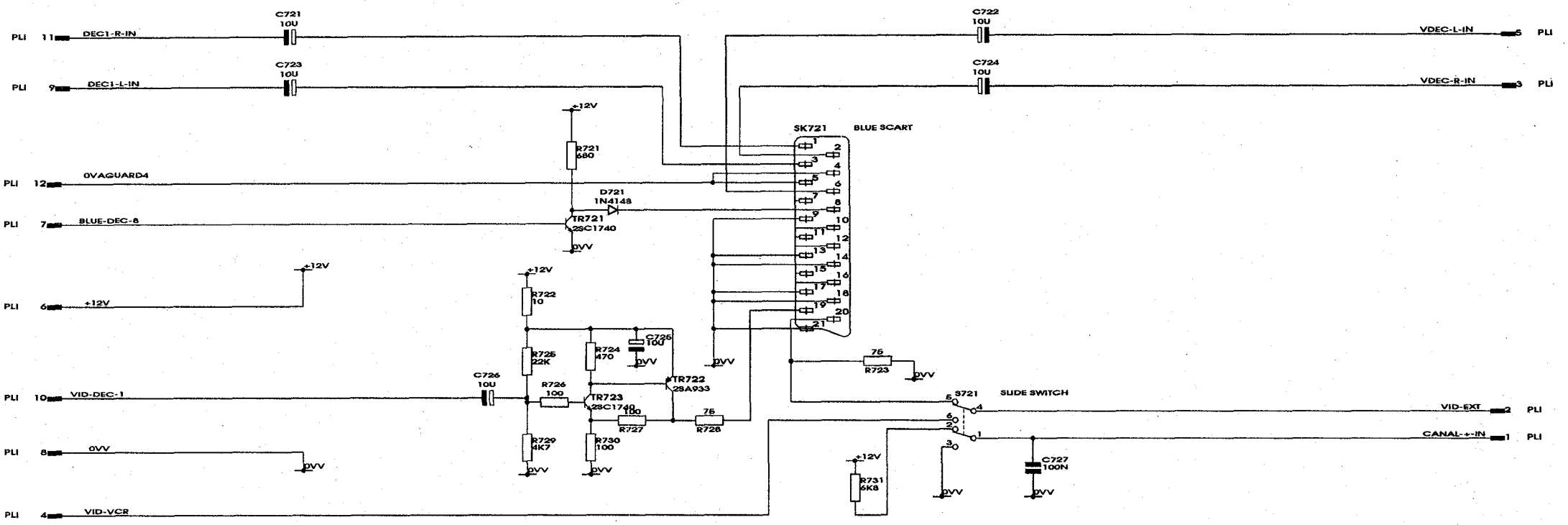
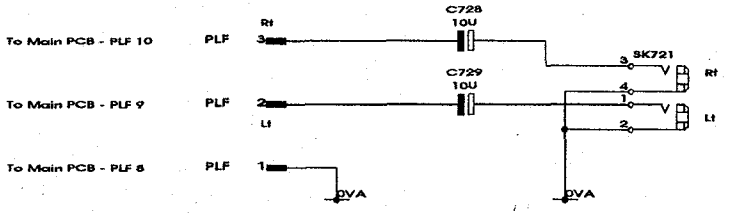
Piggyback PCB Schematic Diagram



Canal+ Schematic diagram for SRX1001 only





THE FOLLOWING LINKS TO BE MADE ON MAIN BOARD

LK3, LK4, LK5

DRG.No.
3401-013-2
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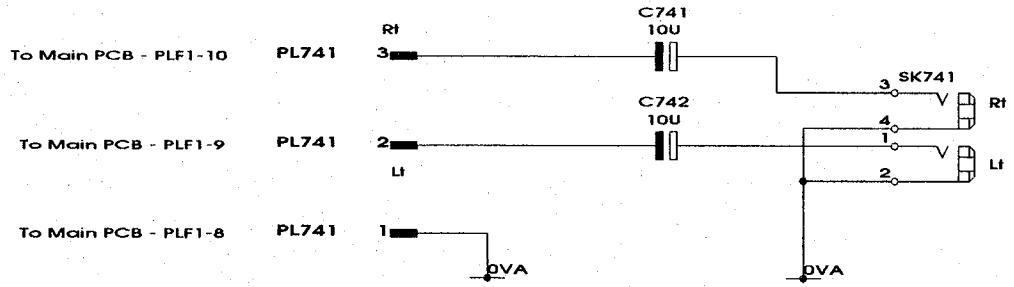
Phono PCB Schematic Diagram SRX1002 only



THE FOLLOWING LINKS TO BE MADE ON MAIN BOARD

LK3, LK4, LK5, LK7

DRG.No.
3401-014E-2
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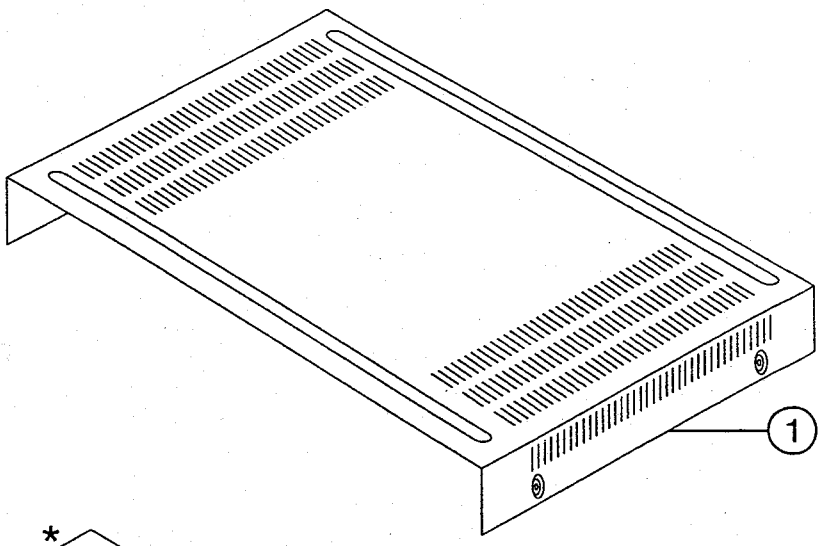
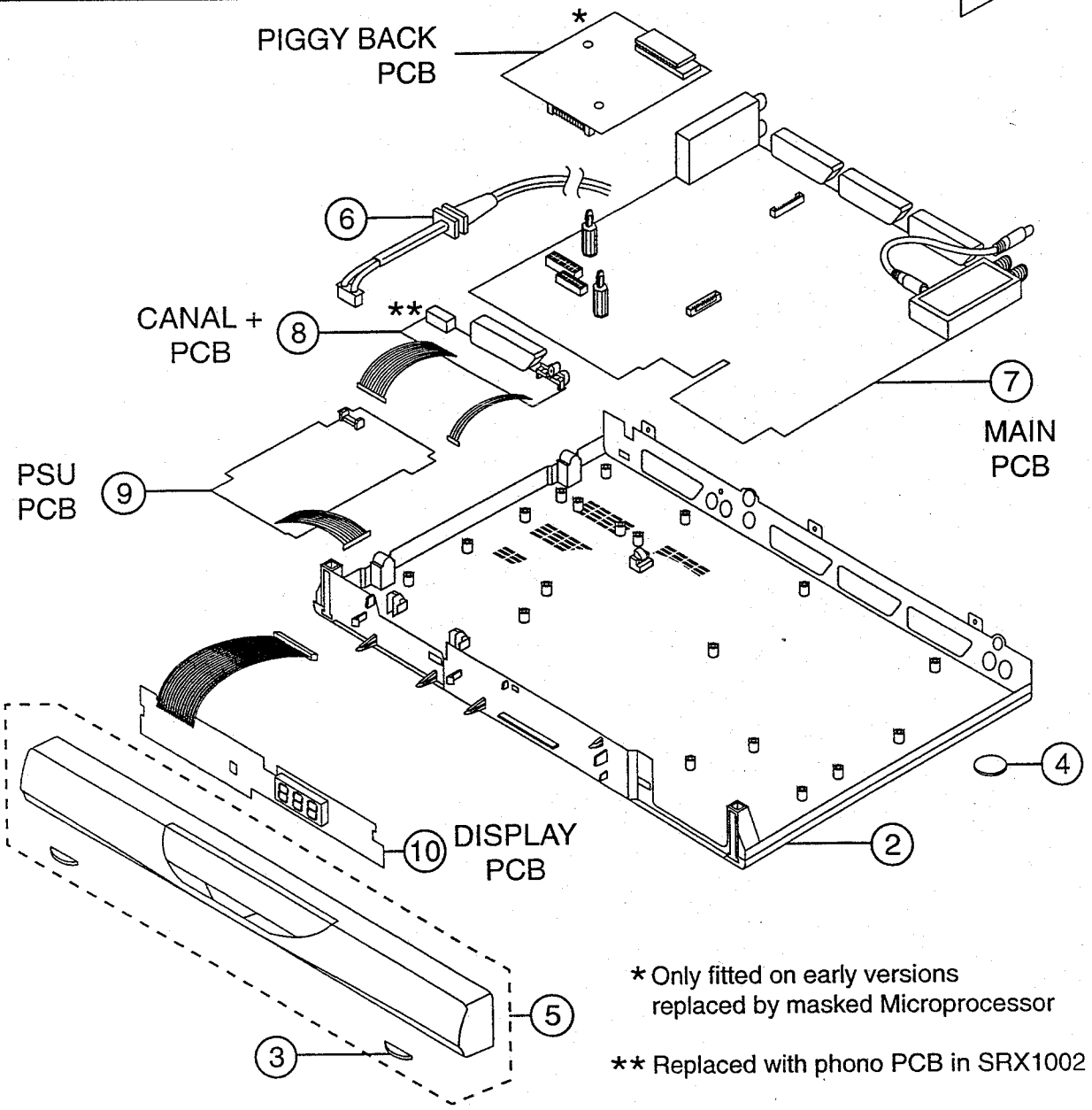
SRX1001/2 Cabinet Parts List

Ref. No.	Description	Pt. No.
1	Top Cabinet	
2	Bottom Cabinet	
3	Foot Rubber Front	
4	Foot Rubber Rear	
5	Front Panel Assy SRX1001	242476
5	Front Panel Assy SRX1002	242478
6 †	Mains Cord Moulded Euro	
7	Main PCB	
8	Canal+ PCB 1001 Only Phono PCB 1002 Only	
9 †	PSU PCB Assy.	242480
10	Front Panel PCB	
	Carton SRX1001	242395
	Carton SRX1002	242394
	Packing Card Set	
	User Instructions SRX1001	242477
	User Instructions SRX1002	242479
	Remote Control Handset	242697
	RF Cable	153048





* Only fitted on early versions replaced by masked Microprocessor

** Replaced with phono PCB in SRX1002

Electrical Parts List

Ref. No.	Description	Pt. No.
	ICs	
IC1,2	IC 24C16P EEPROM	242222
IC3	IC MSP3400 Audio Spro *	242422
IC4	IC LM358 TLO72CP D'l OpAmp	242331
IC5,7,9	IC LA7952 Video Switch	250573
IC6,12	IC MC14053 Slow C MOS	242412
IC8	IC KS5514-02 OSD	242423
IC13	ICUPD78016 V1.11 Micro	242824
IC300	IC 27C512 CPU/EPROM V1.11	242469
IC301,305 306	IC 74HC573 SMD	242470
IC302	IC UPD78013 MICRO 64 QFP	242471
IC303	IC 74HC02 SMD	
IC500	LED Display 7 Segment x3	242825
IC501	IC RPM-638CBR-L Rem Sensor	242466
IC600	IC CNY17F-3X Opto coupler	242458
IC601	IC TL431CLP Regulator	242455
IC602	IC LM2574-ADJ SL162767	242456
IC603	IC LM2937ET-12 Regulator	242459
IC604 !	IC TOP202VA SMPS Controller	242457
	Transistors	
TR5,19,22 27,34,36,37 691,722	Tr. 2SA933	204154
TR501,509-10	Tr2SA854S-R	250579
TR2,3,6,7 13-18,20,21 23,26,28-33 35,38-41 500.502-508 690,721,723	TR 2SC1740	50016
TR11	TR DTA114E	273263
TR12	TR DTC124ESA	254076
	Diodes	
D1-3,6-17,32 301,604,721 500-503	D 1N4148	270754
D4	DZ 5V6 ½W	242420
D5	DZ 27V	242421
D18	DZ 5V1	242419
D600	D 1N4007	170457
D601	D DF10M	241403
D602	D BZV47C200 1W / 200V 1W	242451
D603 !	D SRP100K Signal	242447
D605 !	D SRP100B	242449
D606	D BAT42 / AG03 Signal	242450
D607	D RL2Z	240733
D608	D BAV21 / BA157GP	240733
D609	D BYT53F	242667
D611	D SRP100D	242430
D613	D DZ RD8.2EB	242435

	Coils	
L1	Coil 100µH 700mA DCR 0.2R	
L2	Coil 100µH 305 Type	
L3,5,pll to L5	Coil 100µH 405 Type	
L4,6	Coil 12µH 305 Type	
L7,9, besides IC10	Coil 8.2µH 305 Type	
L8,11	Coil 10µH	
L10	Coil 47µH	
L12,13	Coil 4.7µH	
L14	Coil 3.9µH	
L15	Coil 3.3µH	
L600 !	Coil Filter UU9LF-B103 0.2A	242454
L601 !	Coil 10mH UU9LF-B103	
L602	Coil RCR110D-102L	242453
L603	Coil 622LY-330K 33µH	
	Miscellaneous	
C108	Trimmer Cap 30pF	
FS600 !	Fuse 1.25A	240083
IC10	RF Modulator HLRMBPEU36AM	242424
	Remote Control Handset	242697
SK1-3,721	Scart Socket	153030
SK722	Twin Phono Socket HSP-212V	242437
S500-503	Sw Tact P-TO-MK	
S721	Sw Slide S-DP2W	
T600 !	Tx Switching 20W LLP101TH	242436
TUNER1	Tuner Module RWT1520	242426
VR2	VRSF 2k2 Ω Linear	
VR600	VRSF 2.2K Ω	
XL1	Crystal Osc. 18M432 30PPM *	241021
XL2	Crystal 4MHz 20PPM	242407
XL4	Crystal 17M73447	241640
XL7	Trap Resonator TPS4.43MJ	242425
XL300	Crystal 32.768kHz	242475
XL301	Resonator 4MHz	242474
	User Instructions	242477
	Carton	242395
	Set Card Packing	

* If replacing IC3 TC15 with a later version (i.e.MSPC3400TCxx) XL1 must be converted to new type.

Description	Ref. No.	Pt. No.
	Resistors	
	Fusible !	
10 Ω ¼w	R14,26,64,71,81,96,97,107,113 118,722,LK12,HMR8	
10 Ω 1/8w	R722	
	Resistors 1/6w	
8.2 Ω	R512,518,523	
33	R502,504,506,514,516,519,520 522	
47 Ω	R22,605,607	
68 Ω	R15,73	
75 Ω	R28,53,57,72,95,139,723,728	
82 Ω	R149,692	
100 Ω	R18-21,29,52,63,70,94,106,156 501,505,513,515,518,726,727 730	
120 Ω	R148	
130 Ω	R155	
150 Ω	R78,104,161	
180 Ω	R69,166	
220 Ω	R60,68,69,117,152	
240 Ω	R90	
270 Ω	R119,134,163	
300 Ω	R103	
330 Ω	R693	
390 Ω	R153,C300	
470 Ω	R46,47,105,123,125,154157 613,724	
510 Ω	R694	
560 Ω	R133	
680 Ω	R49,54,721	
750 Ω	R17	
1K Ω 1%	R609,617	
1K Ω	R11,27,48,79,85,87,102,121 122,132,134,140,145,151,159 162,609,612,617	
1.1k Ω 1%	R614	
1.2K Ω	R114,150,517	
1.5K Ω	R127,165	
1.6KΩ	R23	
2.2K Ω	R8,91	
2.7K Ω	R9	
3.3K Ω	R31,55,611	
3.9K Ω	R16,62,66,144	
4.7KΩ	R3,5-7,10,12,13,24,25,41,89 135,729	
5.1K Ω	R8	
5.6K Ω	R56	
6.8K Ω	R61,67,158,731	
10K Ω 1%	R147,608	

Description	Ref. No.	Pt. No.
	Resistors (Continued)	
10K Ω	R4,33,34,37,58,59,83,89,142 160,167,pll to D15,16 500,503,507-511,521690,691	
12K Ω	R82,84,93,138,164	
15K Ω	R	
18K Ω	R	
22k Ω	R141,143,725,Tr31 & Tr39 B to 0VV	
33K Ω	R35,36,88	
47K Ω	R32,120,124,146	
56K Ω	R30	
82K Ω	R65	
100K Ω	R50,51,80,115,116,136,137 600,604	
220K Ω	R112	
390K Ω	R42-45,98-101,108-111	
1M Ω	R74,75,86,602	
	Resistors ¼w	
10 Ω	R616	
75 Ω	R723,728	
100 Ω	R615	
1.5K Ω ½W	R619	
1M Ω	R602	
	Resistors 1W	
1K Ω	R606	
	Resistors SMD 1/10w	
4.7K Ω	R302	
10K Ω	R300,303,304	
	Capacitors	
	Electrolytic	
0.33µF 16V	C104	
1µF 16V	C72,73,112	
3.3µF 50V	C45	
4.7µF 16V	C101	
4.7µF 50V WXA Type	C617	
10µF 25V	C21,28,30,32,33,42,60,66,75-78 80-82,84-87,93,94,96,97,106 113-116,120-123,135,149,156 310,690,721-726,728,729,741 742	
10µF 35V	C15	
22µF 16V	C35-38,83,98,117,127,163,691	
22µF 25V	C603	
33µF 16V	C159	
47µF 16V	C606	
47µF 400V	605	

Description	Ref. No.	Pt. No.
	Capacitors	
	Electrolytic (Continued)	
100µF 6.3V	C55,162,503	
100µF 10V	C500-504,623	
100µF 16V	C3,5,7,9,125,126,141, 153-155,158,621,623	
100µF 25V	C616	
100µF 35V	C11,13,25,618	
22uF 10V	HMC1	
220µF 35V YXB	C610	242427
330µF 10V	C620	
470µF 10V	C619	
470µF 16V	C614	242428
2200µF 16V	C613	
	Ceramic	
1.5pF	C23,24	
10pF	C bet Tr13,14 B to earth	
18pF	C19	
22pF	C79	
27pF	C304-307	
33pF	C19,58,59,64,128	
39pF	C105	
47pF	C16,17,109	
56pF	C18,61	
68pF	C39,110,111	
82pF	C144,152	
100pF	C63,99,100,102,R618	
100pF 1kV	C604 ! *	
120pF	C147	
150pF	C65,151	
180pF	C146	
200pF	C145	
270pF	C142	
330pF	C69,74,124	
390pF	C40,41	
470pF	C46,47	
680pF	C69,74	
1200pF	C103	
0.001µF	C26,27,70,71	
0.0012µF	C	
0.0022µF ! KD	C608	
0.0012µF 2%	C148	
0.0047uf	HMC7,8	
0.01µF	C34	
0.01µF 1KV	C602	
0.022µF	C79	
0.1µF	C1,2,4,6,8,10,12,14,20,22,29,31 43,44,56,62,107,131,132,140 161,301-303,309,311,312,727	

Description	Ref. No.	Pt. No.
	Capacitors	
0.1µF CL-X2	C600	
0.22µF	C54,308,612	
0.33µF	C48-53,129	
0.47µF	C143	
	Polyester	
0.0012uF	C148	
0.1uF	C607,609,624	
0.22uF	C54,612	
0.33uF	C48-53,129	
0.47uF	C143	

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